CPX8216 and CPX8216T

Installation and Use

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USA

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual could result in personal injury or damage to the equipment.

The safety precautions listed below represent warnings of certain dangers of which Emerson is aware. You, as the user of the product, should follow these warnings and all other safety precautions necessary for the safe operation of the equipment in your operating environment.

Ground the Instrument.

To minimize shock hazard, the equipment chassis and enclosure must be connected to an electrical ground. If the equipment is supplied with a three-conductor AC power cable, the power cable must be plugged into an approved three-contact electrical outlet, with the grounding wire (green/yellow) reliably connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards and local electrical regulatory codes.

Do Not Operate in an Explosive Atmosphere.

Do not operate the equipment in any explosive atmosphere such as in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment could result in an explosion and cause injury or damage.

Keep Away From Live Circuits Inside the Equipment.

Operating personnel must not remove equipment covers. Only Factory Authorized Service Personnel or other qualified service personnel may remove equipment covers for internal subassembly or component replacement or any internal adjustment. Service personnel should not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, such personnel should always disconnect power and discharge circuits before touching components.

Use Caution When Exposing or Handling a CRT.

Breakage of a Cathode-Ray Tube (CRT) causes a high-velocity scattering of glass fragments (implosion). To prevent CRT implosion, do not handle the CRT and avoid rough handling or jarring of the equipment. Handling of a CRT should be done only by qualified service personnel using approved safety mask and gloves.

Do Not Substitute Parts or Modify Equipment.

Do not install substitute parts or perform any unauthorized modification of the equipment. Contact your local Emerson representative for service and repair to ensure that all safety features are maintained.

Observe Warnings in Manual.

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed. You should also employ all other safety precautions which you deem necessary for the operation of the equipment in your operating environment.

Warning

To prevent serious injury or death from dangerous voltages, use extreme caution when handling, testing, and adjusting this equipment and its components.

Flammability

All Emerson PWBs (printed wiring boards) are manufactured with a flammability rating of 94V-0 by UL-recognized manufacturers.

EMI Caution

Caution

This equipment generates, uses and can radiate electromagnetic energy. It may cause or be susceptible to electromagnetic interference (EMI) if not installed and used with adequate EMI protection.

CE Notice (European Community)

Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Emerson products with the CE marking comply with the EMC Directive (89/336/EEC). Compliance with this directive implies conformity to the following European Norms:

EN55022 “Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment”; this product tested to Equipment Class A

EN 300 386 V.1.2.1 “Electromagnetic compatibility and radio spectrum matters (ERM); Telecommunication network equipment; Electromagnetic compatibility (EMC) requirements”

System products also fulfill EN60950 (product safety) which is essentially the requirement for the Low Voltage Directive (73/23/EEC).

Board products are tested in a representative system to show compliance with the above mentioned requirements. A proper installation in a CE-marked system will maintain the required EMC/safety performance.

In accordance with European Community directives, a “Declaration of Conformity” has been made and is on file within the European Union. The “Declaration of Conformity” is available on request. Please contact your sales representative.

The product has been designed to meet the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) Directive 2002/95/EC.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Emerson could void the user's authority to operate the equipment.

Use only shielded cables when connecting peripherals to assure that appropriate radio frequency emissions compliance is maintained.

Industrie Canada

This product meets the requirements of the Canadian Interference-Causing Equipment Standard ICES-003.

Cet appareil numérique est conforme à la norme NMB-003 du Canada.

WEEE Compliance

To satisfy the requirements for marking electrical and electronic equipment in accordance with article 11 (2) of Directive 2002/96/EC, Waste from Electrical and Electronic Equipment (WEEE), Emerson includes a crossed-out bin symbol on all standard and noncustom chassis product. This marking fulfills the requirement set out by WEEE that a producer of an electrical or electronic appliance that bears their trade name and is put on the European Union market after 13 August 2005, places a clearly identifiable mark on the equipment and that this mark signifies that equipment is to be reprocessed or recycled using authorized recyclers and processes. This minimizes the disposal of unsorted municipal waste, achieves a high level of separate collection of WEEE, and ensures the environmentally sound disposal of electrical and electronic equipment placed on the market after 13 August 2005.

To dispose of equipment marked with the WEEE symbol, Emerson has contracted with certified companies that can reprocess this equipment per European Union requirements. Please visit the Emerson web site or contact your Emerson representative to find out who to contact and how to dispose of the equipment.

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About This Manual

The *CPX8216 and CPX8216T Installation and Use* manual is written for system installers and administrators. Software developers, system integrators, and service and support personnel will also benefit from the reference information contained in this book.

This manual presents a technical discussion of installation requirements and procedures, as well as operating information and reference material. The information in this manual applies to these models.

Model Number	Description
CPX8216CHAS5E	CPX8216 16-Slot System Chassis
CPX8216TCHAS5E	CPX8216T 16-Slot System Chassis with H.110 backplane

Overview of Contents

This manual is divided into the following chapters and appendices:

Chapter 1, *Introduction*, provides a brief overview of the platform along with a features list.

Chapter 2, *System Architecture*, describes the system domains, platform layout, processor configuration, and details of bus access and hot swap control.

Chapter 3, *Platform Description*, provides a description and reference information for the various subassemblies of the CPX8216 and CPX8216T chassis.

Chapter 4, *Site Preparation*, discusses the proper placement recommendations, environmental conditions, and installation options for the CPX8216 and CPX8216T chassis.

Chapter 5, *Chassis Installation*, tells how to install the CPX8216 enclosure into both 19" and 23" frame relay or EIA racks and cabinets.

Chapter 6, *Chassis Operations*, provides the basic operating procedures, LEDs and controls, power monitoring and cooling for the CPX8216 chassis. The connections to AC and DC power are also discussed.

Chapter 7, *Installing Boards in the Chassis*, describes the precautions and steps you need to follow to install and remove hot swappable boards and transition modules.

Chapter 8, *Drive Removal and Installation*, includes the information required to configure and install both hot swappable IDE and SCSI drives. It provides an overview of carrier frames and how to replace non-hot swap and floppy drives.

Chapter 9, *Subassembly Removal and Installation*, provides instructions on how to replace FRUs, such as fans, power supplies, power distribution panels, and the floppy drive housing.

Chapter 10, *Pin Assignments*, provides pin assignments and signal descriptions for the backplane interconnects, power, and other interface connectors

Appendix A, *Specifications*, describes the mechanical, electrical, and power supply characteristics of the CPX8216 chassis.

Appendix B, *Systeminstallationsanleitung*, describes the system installation procedures in the German language.

Appendix C, *Related Documentation*, lists Emerson, vendor, and specification documents and how to access them.

Summary of Changes

See the table below for manual revisions and changes.

Part Number	Date	Description
6806800A52B	August 2007	Corrected the wire color and configuration for the IDE drive carrier switches
6806800A52C	October 2008	Update document to Emerson style (logo, copyright, trademarks, etc.)

Comments and Suggestions

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In “Area of Interest” select “Technical Documentation”. Be sure to include the title, part number, and revision of the manual and tell us how you used it.

Conventions Used in This Manual

The following typographical conventions are used in this document:

bold

is used for user input that you type just as it appears; it is also used for commands, options and arguments to commands, and names of programs, directories and files.

italic

is used for names of variables to which you assign values, for function parameters, and for structure names and fields. Italic is also used for comments in screen displays and examples, and to introduce new terms.

`courier`

is used for system output (for example, screen displays, reports), examples, and system prompts.

<Enter>, **<Return>** or **<CR>**

represents the carriage return or Enter key.

Ctrl

represents the Control key. Execute control characters by pressing the **Ctrl** key and the letter simultaneously, for example, **Ctrl-d**.

Introduction

1

Overview

The CPX8000 Series Platforms, when combined with the appropriate software, are designed for critical telecommunications infrastructure applications that need to meet five-nines (99.999%) availability. These platforms have built-in redundancy for active system components—including system-slot CPU boards—enabling active modules to be exchanged for repair or upgrade while the system continues to operate. Designed as a carrier grade platform for operation in NEBS and ETSI environments, the CPX8216/8216T is particularly well-suited for switching applications and deployment within unattended sites.

The CPX8000 Series Platforms, hereafter referred to as either the CPX8216 or CPX8216T have either AC or DC power and backplane features; the CPX8216T has the H.110 telecommunications bus.

Chassis Features

The CPX8216 contains the following:

- Dual 8-slot CompactPCI passive backplane
- Hot-swappable CPU and I/O boards
- N+1 or 2N redundant CPU and I/O boards
- Up to three 400W hot-swappable, N+1 redundant power supplies
- Wide-ranging AC and DC input versions
- Three hot-swappable, redundant fans with filter options
- Four drive bays for hot swap 3.5" drives (with hot swap drive carrier), standard 3.5" drives, or 5.25" drives
- Front access service and installation of CompactPCI boards, drives, fans, and power supplies
- Rear-connection I/O, allowing card removal without disconnecting field wiring
- Detection and remote reporting of power, temperature, and fan fail conditions
- NEBS-compliant alarm status display panel
- Type AB connectors for rear panel I/O on the backplane, compliant to CompactPCI specification revision 3.0
- Full OEM configuration capability
- Rack mountable in a number of different configurations

In addition, the CPX8216T has the following additional features:

- H.110 across P4 on the backplane
- BAT and Ring voltage connectors on the H.110 DC power distribution panel

System Architecture

2

Overview

The CPX8000 Series Platform is designed to be fully compliant with the CompactPCI Hot Swap Specification developed by the PCI Industrial Computers Manufacturing Group (PICMG). With the proper software support and testing, it should be possible to integrate all proprietary and third-party I/O modules which are compatible with this specification. Further, the platform allows the use of I/O modules which are not hot swappable, but the chassis must be powered off when such modules are inserted and extracted.

The CPX8216 also features the ability to hot swap system processor boards, a feature which is beyond the scope of the PICMG specification. At this point there are no third-party CPU modules which are compatible with the CPX8216 platforms.

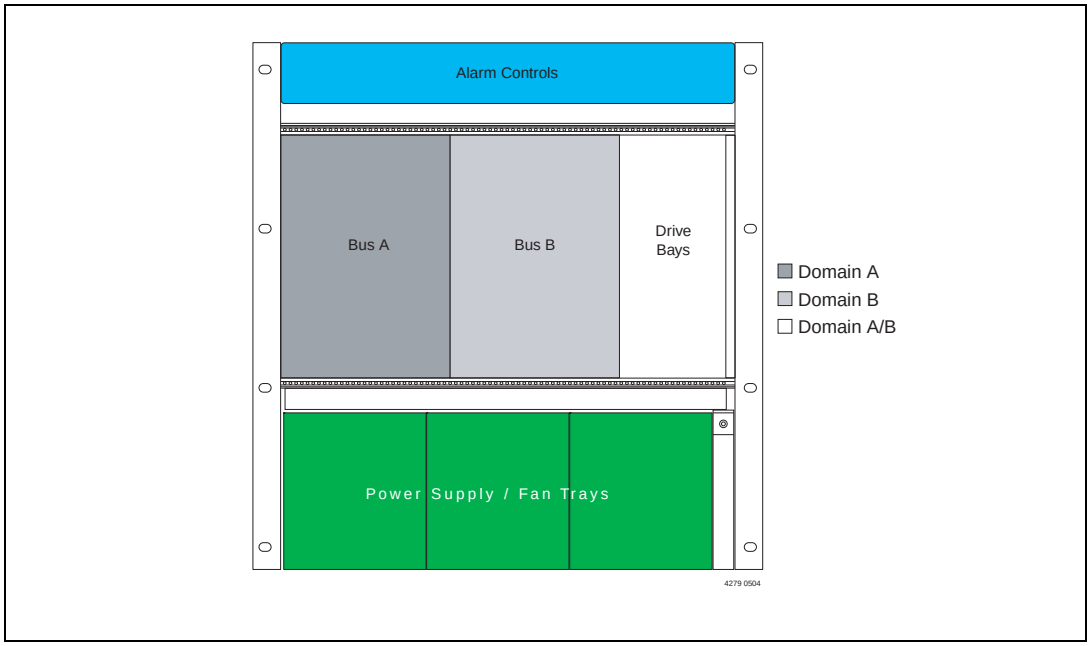
System Domains

The high availability and high slot count of the CPX8216 platforms are made possible by implementing two host CPU slots and multiple CompactPCI bus segments in a single chassis. These bus segments, along with other system resources are grouped into two logical domains, A and B, which can be controlled by either host-HSC pair regardless of the bus segment the host sits on.

- Domain A includes CompactPCI bus segment A (slots 1 to 8), the power supply/fan tray modules, and alarm controls
- Domain B consists of the CompactPCI bus segment B (slots 9 to 16).

For further information on domain control or ownership, see the section, *Hot Swap Controller* on page 8.

Figure 2-1. Bus Domains



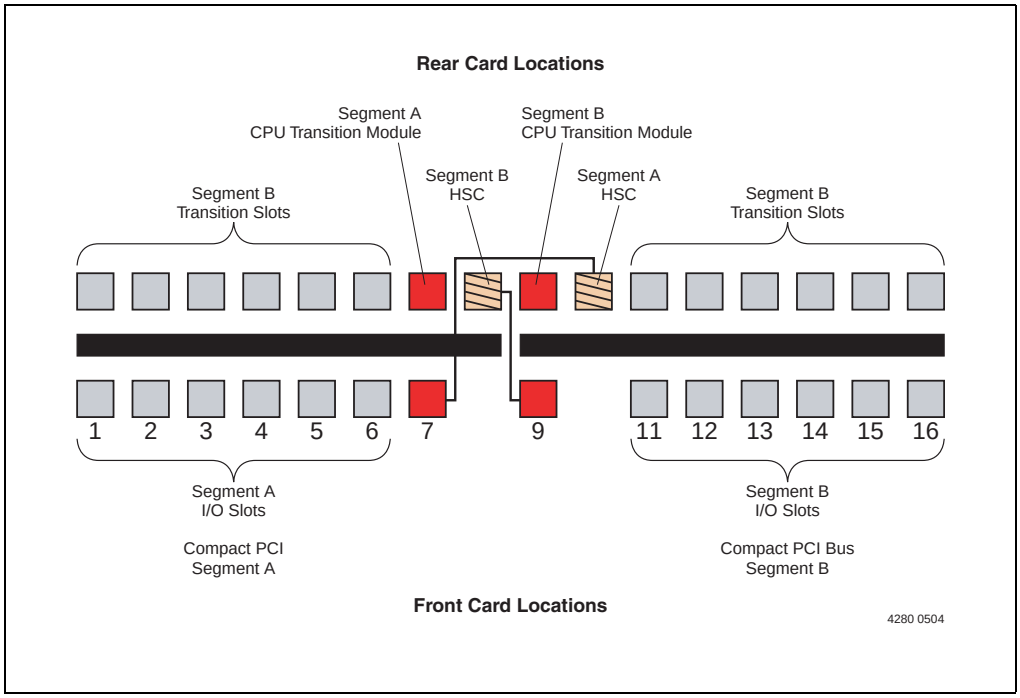
Platform Layout

The CPX8216 is a 16-slot, high-availability CompactPCI chassis with two separate 6-slot CompactPCI I/O domains and the capability to contain redundant CPU modules and redundant Hot Swap Controller (HSC) modules. It is also possible to configure the chassis as a simplex, high I/O system containing a single CPU-HSC pair. Even as a simplex system, the CPX8216 still provides improved availability through redundant power supplies and the control/monitoring capabilities of the HSC, as described in *The Hot Swap Controller/Bridge (HSC) Module* on page 7.

CPX8216 Standard Layout

The CPX8216 chassis consists of two 8-slot subsystems, or domains, each with two slots for the host processor and six slots for nonhost CompactPCI boards. The HSC board mounts in the rear of the chassis, behind the secondary CPU slot. The next figure provides a diagram of this configuration.

Figure 2-2. CPX8216 Standard Layout

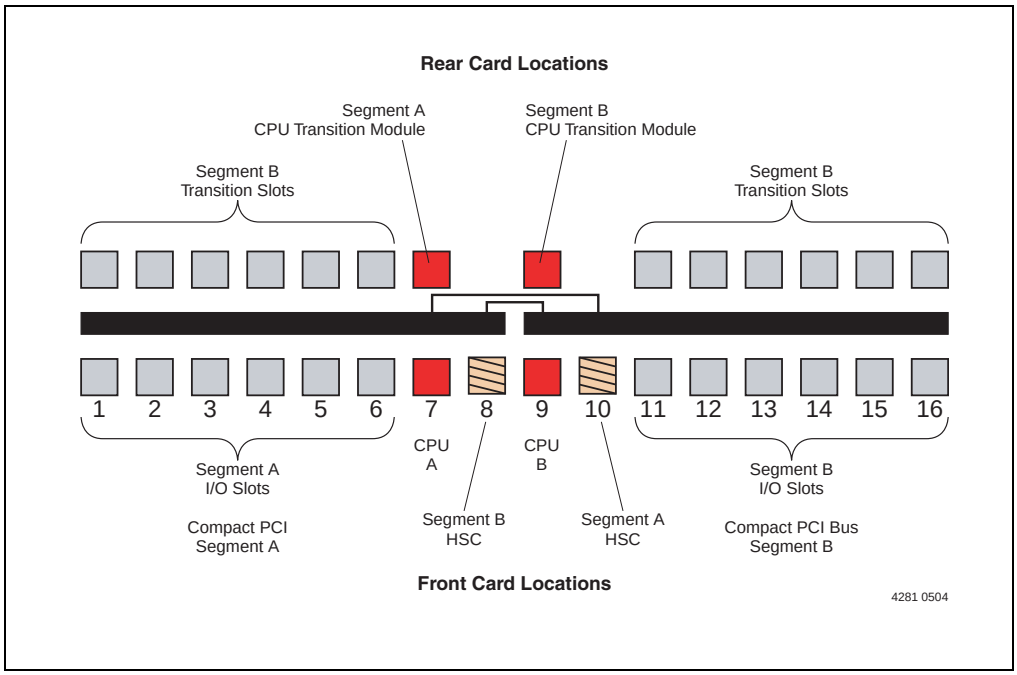


Each of the two independent I/O domains has its own system processor slot. Each system processor has direct access to its local bus through an onboard PCI-to-PCI (P2P) bridge. Each domain is also capable of supporting a Hot Swap Controller (HSC) module that contains its own P2P bridge. Thus, in a fully redundant configuration, there are two bridges that have access to each of the I/O buses—one associated with the CPU and one with the HSC. Only one of the bridges may be active at a time.

CPX8216T (H.110) Layout

The CPX8216T H.110 chassis consists of two 8-slot subsystems, or domains, each with one slot for the host processor, one slot for the front-loaded HSC, and six slots for nonhost CompactPCI boards. The next figure provides a diagram of this configuration.

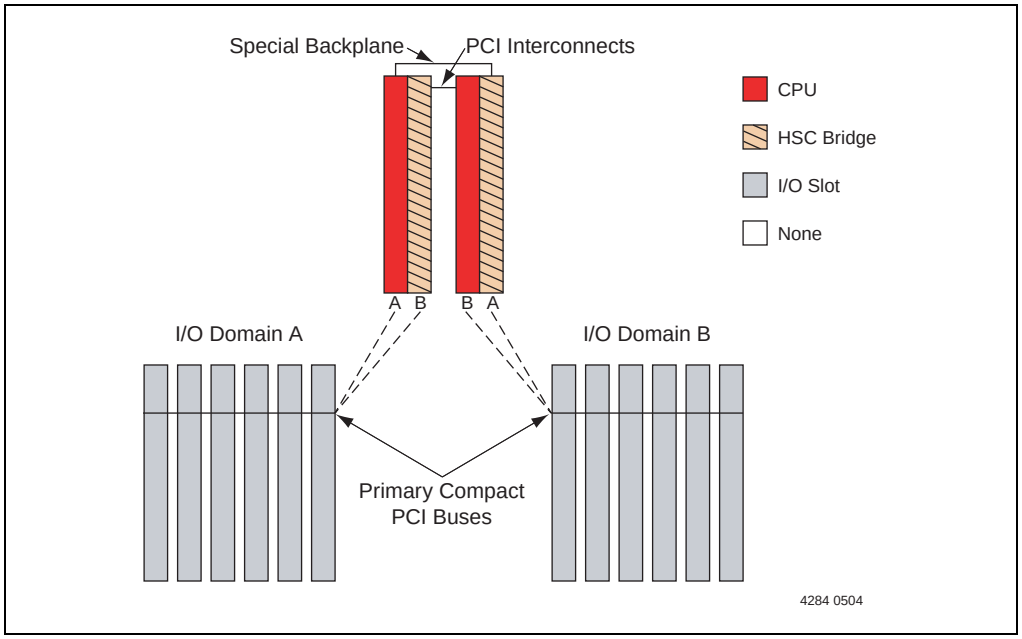
Figure 2-3. CPX8216T (H.110) Layout



Bus Access and Control

In the fully redundant configuration, the CPU in the left system slot, CPU A, is associated with the HSC in the right HSC slot, HSC A (note that HSC A actually sits on the Domain B bus). There is a local connection between each CPU-HSC pair that allows the CPU in one domain to control the other domain through its HSC. This architecture is illustrated in the following figure.

Figure 2-4. CPX8216 I/O Bus Connectivity



In addition to providing bridges to the remote I/O buses, the HSC provides the services necessary to hot swap CPU boards and nonhost processor boards and also controls the system alarm panel, fans, and power supplies.

The Hot Swap Controller/Bridge (HSC) Module

The HSC module connects to the CPU module through a local PCI bus, as illustrated in Figure 2-2 on page 5 and Figure 2-3 on page 6. The HSC module contains a PCI-to-PCI bridge and also contains a Hot Swap Controller.

The functionality provided by the HSC is at the heart of the High Availability CPX8216 Platforms. Its primary functions include:

- Providing a bridge between the two eight-slot CompactPCI buses so that they can be managed by a single CPU module
- Maintaining a Control Status Register which contains information on the status of each chassis module
- Controlling power and resets to each chassis module through radial connections
- Monitoring and controlling CPU boards, nonhost boards, and peripherals, including power and fan sleds, board and system LEDs, and alarms

Hot Swap Controller

Each of the nonhost slots in the chassis can be controlled from either HSC. When an HSC has control over a domain, it has control over the nonhost boards in that domain. Each host processor/bridge pair is controlled as a single item by the other processor/bridge pair. The bridge and the host processor are linked together so that both must be present for power to be applied. A host processor cannot be operated without its HSC.

With the CPX8216 architecture it is important that the system initializes to a state that allows the host processors and HSCs to be in control of the system. The default conditions are:

- System processors and bridges are powered up (if present)
- System processors and bridges are disconnected from their busses
- HSCs are not in control of either domain
- Nonhost boards are powered off
- Peripheral bays are powered up (if present)
- Fans and power supplies are powered on

On a power cycle, all HSC registers are reset to default values. On a host reset or host PCI reset the HSC clears its configuration space to default values and resets its Interrupt Mask register. Other HSC registers are not affected by host reset. This has implications for domain control. For example, if a host is controlling Domain A at the time of reset, when the host reboots it will still have control of Domain A and the PCI bridges and busses for Domain A will be initialized. To ensure that a host reset does not adversely affect other boards in the system, you should release control before reset or transfer control to the standby host. Transferring control will prevent interruption in system service.

Note Chassis components such as fans and power supplies may be controlled by either HSC but not both. Default control belongs to Domain A and whichever HSC has control of Domain A has control of the system functions.

If Domain A is not controlled, nonhost boards are powered-off and all LED updates to the display panel and power supplies are suspended. Also, monitoring of alarm inputs from the display panel and power supplies are inhibited.

Subsequent to the default, the system software must determine the configuration of the system and then proceed to change it.

System Processor Configurations

The CPX8216 is a flexible platform that allows for multiple configurations of processor control, I/O redundancy, and peripheral configurations. The following sections briefly touch on the three possible processor/control configurations:

- A simplex system containing a single CPU-HSC pair controlling both I/O domains
- An active/passive configuration similar to the simplex configuration, but providing a warm backup for both the CPU and the HSC
- An active/active or load-sharing configuration in which each CPU runs a single domain while also serving as a backup to the other CPU.

Note H.110 traffic and HA Linux do not support a load-sharing configuration.

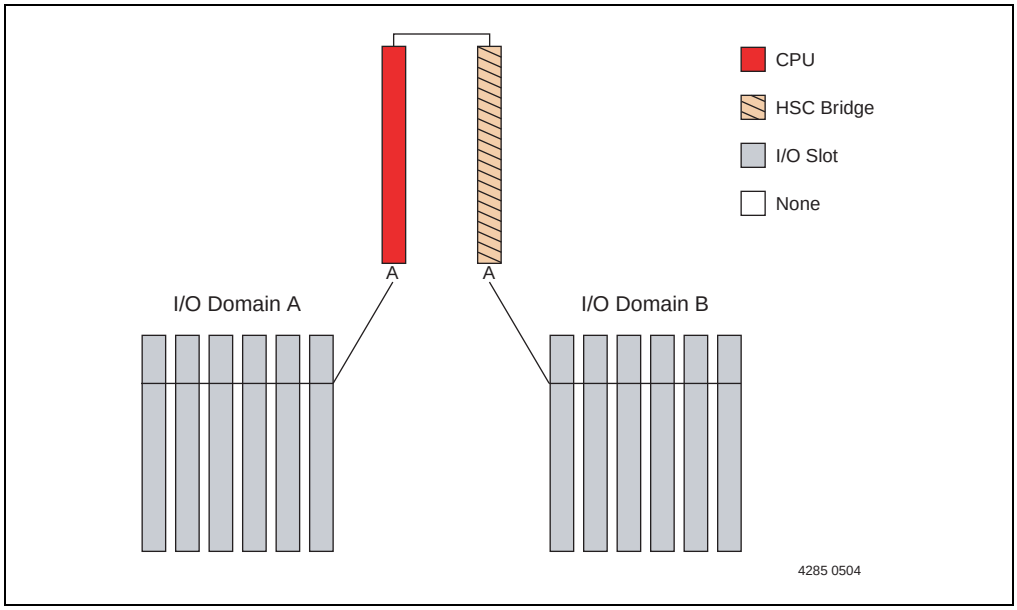
The following sections give a general description of these configurations.

The Simplex Configuration

Because of the flexible nature of the CPX8216, it is possible to configure it with different levels of redundancy and availability. For applications which do not require the benefits of full high availability, it is possible to configure the CPX8216 as a simplex, 16-slot system. This configuration provides the benefits of redundant power supplies and the system monitoring capabilities of the fully redundant configuration.

The simplex configuration is illustrated in the following figure.

Figure 2-5. Simplex Configuration

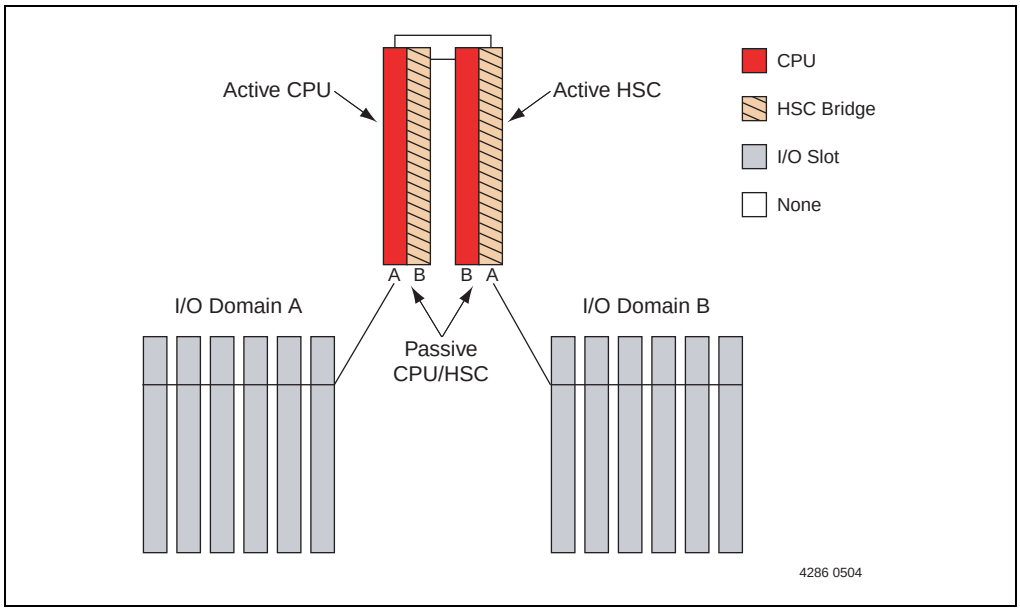


The Active/Passive Configuration

In the active/passive configuration, one CPU manages all twelve I/O slots, much like in the simplex configuration. In addition, the second CPU serves as a warm standby, ready to run the system in the event of a failure on the active system.

The active/passive configuration is illustrated in the following figure.

Figure 2-6. Active/Passive Configuration

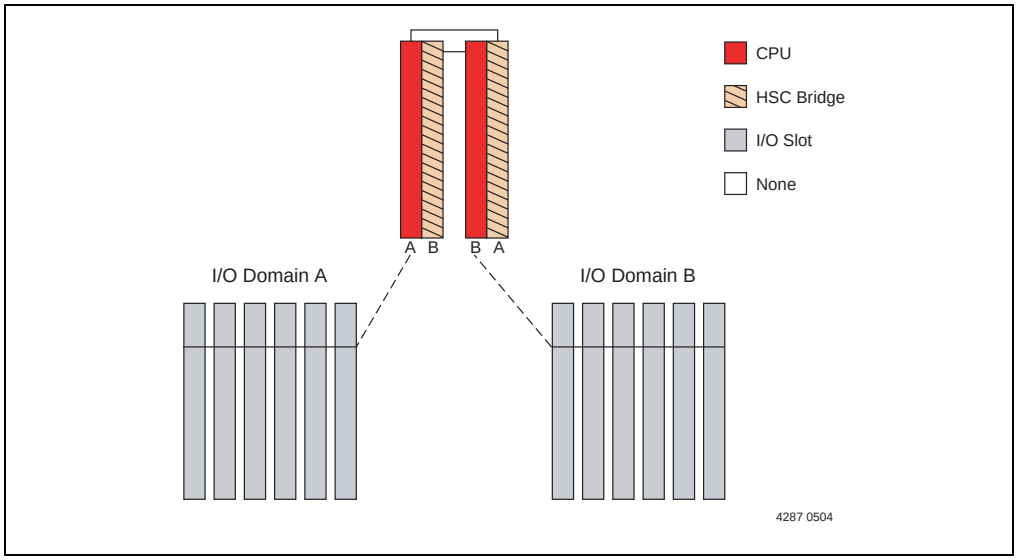


The Active/Active or Load-Sharing Configuration

In the load sharing configuration, each CPU manages six of the twelve I/O slots, much like a dual 8-slot system with the added benefit of one CPU being able to control all twelve I/O slots if the other CPU fails. It is important in a load-sharing configuration to note that the total critical activity does not exceed the capabilities of a single CPU, as either one of the CPUs must be ready to take over the load carried by the other.

The active/active configuration is illustrated in the following figure.

Figure 2-7. Active/Active Configuration



Note H.110 traffic and HA Linux do not support a load-sharing configuration.

I/O Configurations

The CPX8216 contains two independent 8-slot CompactPCI buses. One slot in each bus is dedicated to a system processor, and another is needed for the HSC. This leaves six slots on each bus to support I/O devices or nonsystem processors.

One possible configuration is to use the CPX8216 as a high I/O CompactPCI system with redundant CPUs. With this configuration, it is possible to run twelve independent I/O modules within a CPX8216 system. Applications requiring dense processing power could use all twelve I/O slots to support nonsystem processors.

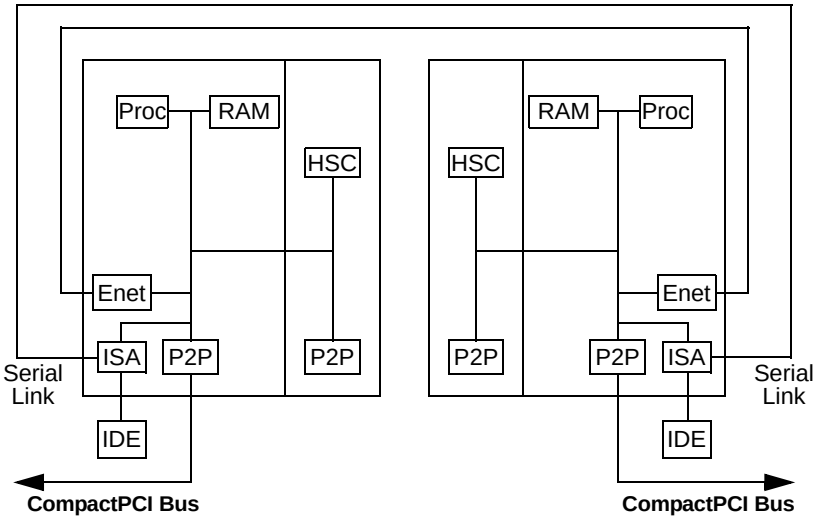
Such a system would be protected against a CPU or HSC fault, but it would be vulnerable to data losses if any of the I/O modules or nonsystem processor modules were to fail. In systems handling critical data, it is possible to implement a 2N or an N+1 I/O redundancy strategy that allows the level of service to be continued in the event that a module fails.

In the case of a 2N-redundant system, each I/O module or nonsystem processor module is matched with an identical module on the other bus. The paired modules can be configured in an active/passive arrangement or a load-sharing arrangement in which each carries half of the load of a single module. In an N+1 arrangement, multiple modules are backed up by a single spare. For example, a single passive nonsystem processor module can be used to back up five others.

CPU Complex Architecture

The CPU complex in the CPX8216 contains two CPU modules and their corresponding Hot Swap Controller (HSC) modules. The figure below illustrates the architecture, including elements on the boards as well as local connections between the CPU modules and the PCI-to-PCI (P2P) connections to the local CompactPCI buses.

Local Connections between CPU Modules



The CPU Module

In addition to the processor, RAM, etc., each CPU module contains:

- Up to two Ethernet controllers
- Up to two serial communications links
- P2P bridge to the local CompactPCI bus
- Local PCI Bus connection to the HSC

Switching Service to the Passive CPU

The switchover from one CPU to another is initiated by the passive CPU when there is an indication that there is something wrong with the active CPU, such as a failed heartbeat protocol. The passive side notifies the active side that it is about to begin a switchover process. If the active side agrees to the switchover, then the two sides coordinate the hand-off and no bus signals, clocks, or devices should be corrupted. Bus signals, clocks, and devices attached to the bus may be corrupted if the active system fails to cooperate with the takeover attempt.

In a more extreme takeover, it is possible for the passive CPU to power-on reset the active CPU and to take control that way.

Board Insertion and Extraction Features

The PICMG Specification details software and hardware features in order to support hot-swapping of I/O boards. Hardware features include:

- Staged pins that control voltages when inserting or extracting boards
- BD_SEL#, HEALTHY#, and ENUM# signals
- Hot swap control status register

Staged Pins

The PICMG CompactPCI Hot Swap Specification provides for three separate pin lengths in order to control the insertion and extraction voltages and to notify the system when boards are inserted or extracted.

The longest pins, which include VCC pins and GND pins, are the first to mate during the insertion process and the last to break contact during extraction. These pins are used to supply power to pre-charge the PCI interface signals to a neutral state before they contact the bus. This pre-charging serves to minimize the capacitive effects of the board as it makes or breaks contact with the bus.

The medium-length pins carry PCI and other signal traffic.

The shortest pins are used to assert signals, including BD_SEL#. During insertion, the BD_SEL# signal enables the board to attach to the local PCI bus. On extraction, it causes the board to logically and electrically disconnect from the PCI bus before the bus pins physically break contact with the bus.

BD_SEL#

BD_SEL# is asserted by one of the pins that mate last on insertion and break first on extraction. On insertion, the signal tells the board to connect to the PCI bus. On extraction, this pin breaks first causing the board to logically and electrically disconnect from the PCI bus before the PCI bus pins physically break contact with the bus.

ENUM#

An ENUM interrupt is generated when a board is hot inserted into the CPX8216 chassis, or when an operator trips the board microswitch by raising its ejector handles. The signal informs the active CPU that the status of a board has changed. The CPU then identifies the board by polling the INSert and EXTract bits in all of the boards' Control Status Registers.

Hot Swap Control Status Register (CSR)

The CPX8216 supports hot swap CompactPCI cards with the standard control status register defined by the PICMG Hot Swap Specification. The register is visible in PCI configuration space and provides hot swap control and status bits INS and EXT. The INS signal is set when ENUM# is asserted by a board being inserted into the chassis. The EXT signal is asserted when ENUM# is asserted by an operator triggering the microswitch in the board handles. The host also uses these bits to acknowledge and deassert ENUM#.

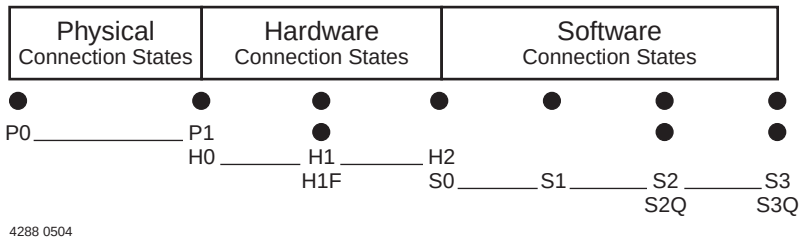
Typical Insertion and Extraction Processes

Many of the steps in the insertion and extraction processes are automated by software. After the operator installs a board, it automatically advances to P1, see *The Hot Swap Process*. The hardware connection process proceeds automatically and asserts the ENUM# signal to initiate the software connection process. The host responds to the bussed ENUM# signal by reading the Hot Swap Control Status Register of each board to find out which one is signaling an insertion or extraction (INS or EXT bit asserted). Upon detecting an insertion, the host responds by adding software drivers to support the newly inserted board.

Extraction is initiated when the operator opens the board ejector handle, which activates a mechanical switch to assert ENUM#. The hot plug system driver senses ENUM# and notifies software that board activity must be quiesced and that software device drivers should be unloaded. The application that is using the board is informed that the resource is no longer available. When the board is ready for extraction, software informs the operator by illuminating the blue LED. After extraction, all system resources previously assigned to that board are made available for other uses.

The Hot Swap Process

PICMG divided the complete hot swap process into physical, hardware and software connection processes. These processes are formally broken down further into a group of transitional states, which are illustrated in the following figure.



When a board is inserted it goes through all states from P0 to S3. Conversely, a board transitions from S3 to P0 before being extracted. During normal operation, no states are skipped. Extracting a board in a software connection state other than S0 is likely to disrupt software enough to crash the system, but the CompactPCI bus, from a purely electrical point of view, will not be disrupted enough to cause logic levels to be violated.

Certain states are overlapping. For example, when the board is fully seated (completed P1), but has not yet started the hardware connection process (H0), it said to be in the P1/H0 state. Similarly, a board can also be in the H2/S0 state.

Physical Connection Process

The physical connection process is the basic process of putting a board into a live chassis, or physically removing the board. The process includes two states:

- P0 - The board is physically separate from the chassis
- P1 - The board is fully seated, but not powered, and not active on the PCI bus. All pins are connected.

Hardware Connection Process

The hardware connection process involves the electrical connection or disconnection of the board. This process includes three states:

- H0 - The board is not active on the PCI bus. This state is equivalent to P1 above.
- H1 - The board has powered up and is sufficiently initialized to connect to the PCI bus.
- H2 - The board is powered, and enabled for access by a PCI bus transaction (normally by the host) in PCI configuration space only. The board configuration space is not yet initialized.

When a newly inserted board has completed H2, the board is operable from a hardware perspective. It has run its power up diagnostics, initialized itself, loaded EEPROM data, etc. The blue LED is off in the H2 state, indicating that the board should not be pulled out.

Software Connection Process

The software connection process includes the tasks needed to configure and load software. This process contains four states:

- S0 - The Software Connection Process has not been initiated. The board's configuration space registers are accessible but not yet initialized.
- S1 - The board is configured by the system. The system has initialized the board's PCI configuration space registers with I/O space, memory space, interrupts, and PCI bus numbers. The board is ready to be accessed by a device driver but no drivers are loaded at this time.
- S2 - The necessary supporting software (drivers, etc.) have been loaded. The board is ready for use by the OS and/or the application, but no operations involving the board are active or pending.
- S3 - The board is active. Software operations are either active or pending.

Software Disconnection Process

The software disconnection process defines two additional states which are used when quiescing activity on a board in preparation for extraction:

- S3Q - The software is completing current operations, but is not allowed to start new ones. When current operations are completed, the board transitions to S2.
- S2Q - The board is quiesced. This is the same state as S2, except that no new operations are allowed to be initiated.

The Software Disconnection Process proceeds as S3, S3Q, S2Q, S1, and finally S0.

Hardware Resources

This section briefly describes some of the blades that are available from Emerson that can be used in the CPX8000 Series platforms to build a system for a variety of applications. For further information on each of these components, refer to the specific documents listed in Appendix C, *Related Documentation*. The following list is not fully representative of the different boards that can be used, but by combining the CPX's infrastructure with resources designed to use the infrastructure, this architecture can provide a powerful platform that will support a wide range of telecommunications network applications.

Application and Control Processor Blades

Application processor blades, typically based on Intel architecture processors, can be programmed with standard Linux distributions. This makes them ideal to perform a wide range of system functions such as: running user applications, acting as file servers, or providing an interface to external databases. These blades include the CPN5365 Intel Pentium III, CPN5385 Intel Mobile Pentium III, CPV5370 Intel Pentium III processor boards, and associated transition modules.

Control processor blades are typically optimized for real-time processing. They often incorporate the latest PowerPC ® processor devices, delivering high performance with high levels of power efficiency, while PMC sites allow extra interface customization. This makes them ideal to run embedded control programs or to process communication protocol stacks. These blades include the CPCI-6115 board, based on the MCP7457 PowerPC-compatible processor family, and the related transition modules.

Device Drivers

In order to take full advantage of the high availability functions of the CPX8216 and to support hot swap, board device drivers need to be enhanced. Drivers need to cease all activity when the device is about to be hot-swapped, and they need to support initialization of the device without support from the device firmware or BIOS.

Further, high availability device drivers need to be able to enter a standby mode while bus control is being passed from one CPU to another. They also provide diagnostic interfaces for run-time fault detection and for preinitialization testing of newly inserted boards.

Platform Description

3

Overview

This chapter provides a description and reference information for the various subassemblies of the CPX8216 and CPX8216T chassis. It covers only those items associated with the chassis enclosure. For information about CompactPCI board components, refer to the appropriate chapter in this manual.

Following is a list of the chassis components covered in this chapter:

- *Parts of the Chassis*
- *CompactPCI Card Cage Reference*
- *Backplane Reference*
- *H.110 Bus Connectors—CPX8216T Chassis Only*
- *Alarm Display Panel*
- *Power/Fan Modules*
- *Power Distribution Panel*
- *AC Power Distribution Panel (CPX8216)Dual Input DC Power Distribution Panel (CPX8216)*
- *Dual Breaker DC Power Distribution Panel (CPX8216)*
- *H.110 DC Power Distribution Panel (CPX8216T)*
- *Drive Modules*

Parts of the Chassis

Figure 3-1. CPX8216 Front View

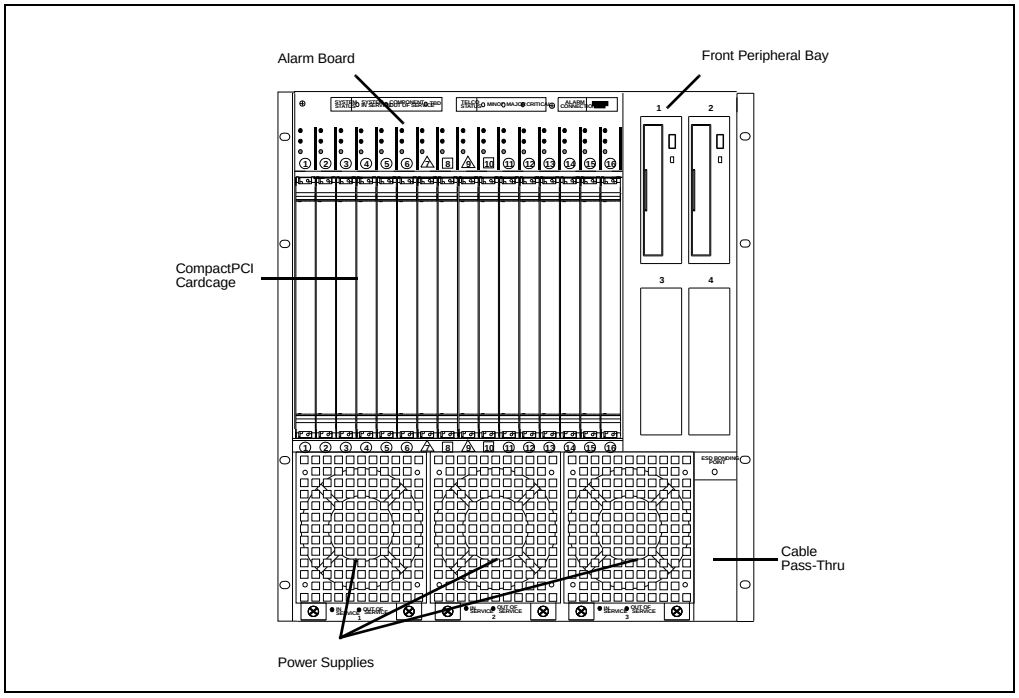
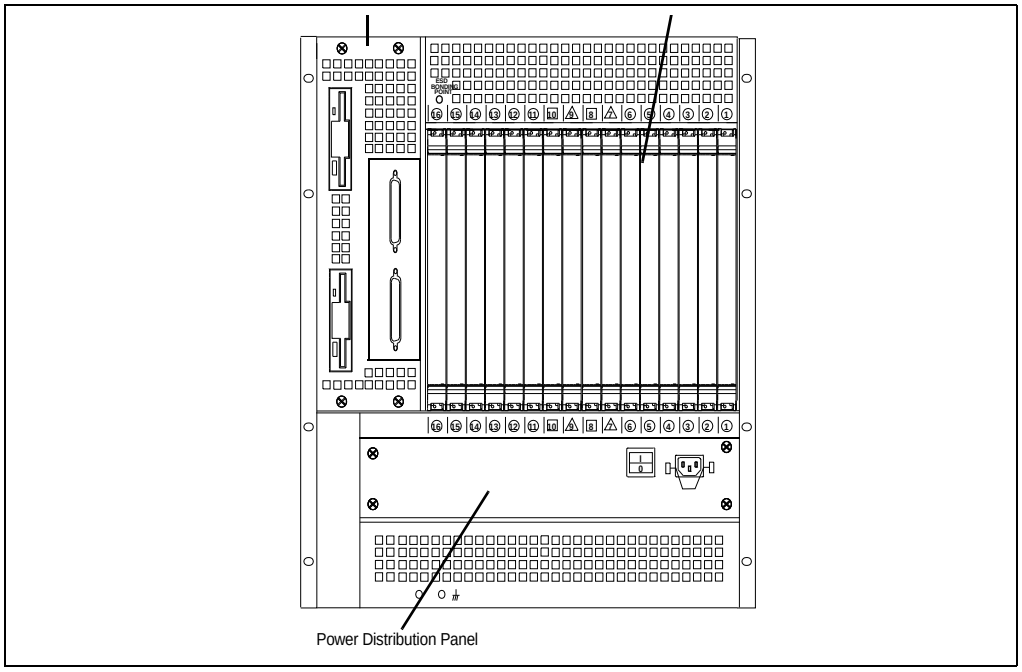


Figure 3-2. CPX8216 Rear View



CompactPCI Card Cage Reference

Industry standard CompactPCI cardguides are used for the front controller boards and rear transition boards. The CPU slot is identified with red guide rails, the I/O slots with black rails, and the Hot Swap Controller/Bridge slots with tan rails.

Figure 3-3. Card Cage Rail Color Scheme - Standard Chassis

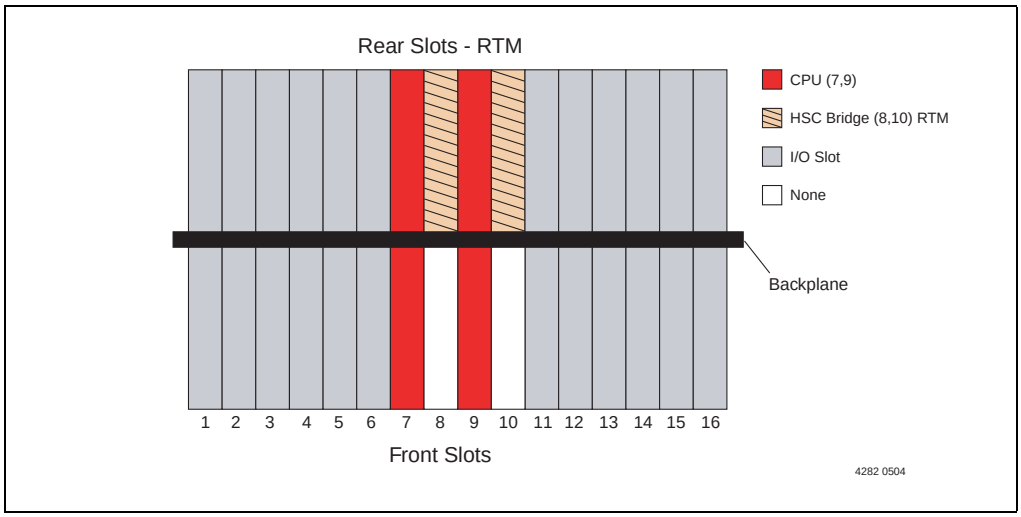
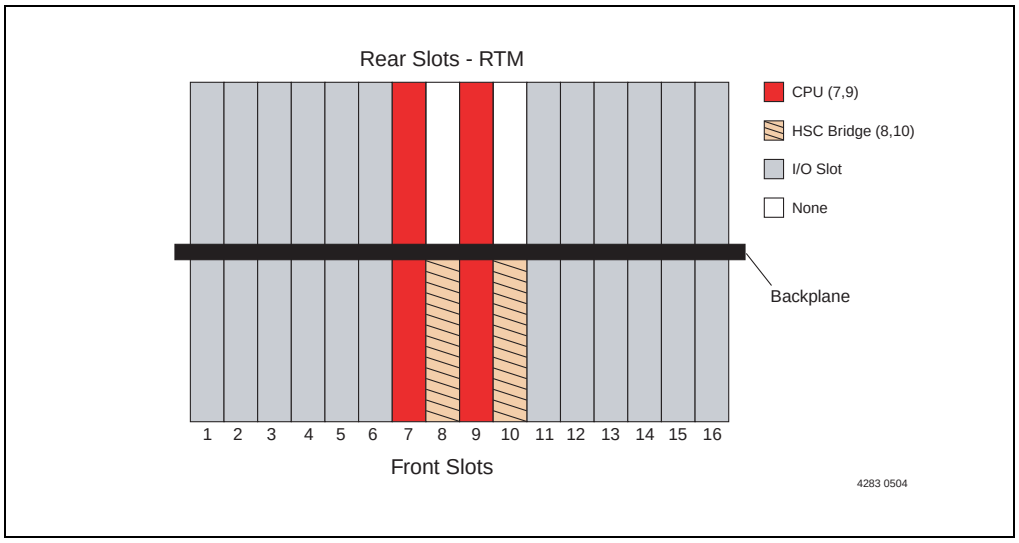


Figure 3-4. Card Cage Rail Color Scheme - H.110 Chassis



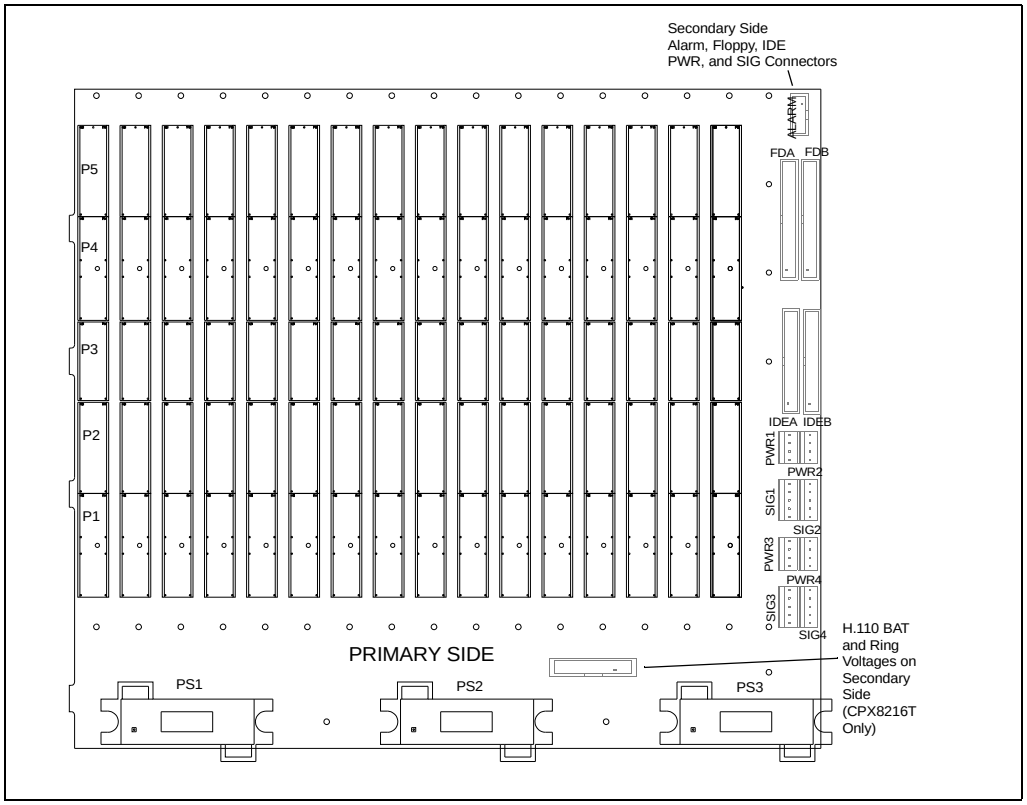
Each slot, both controller and transition, has one ESD cardguide clip and one ESD alignment pin clip. All clips are located on the bottom cardguide only.

Backplane Reference

The backplane provides the interconnect for all 16-slots, 6U CompactPCI bus, N+1 power distribution, alarm signal distribution, and IDE device signal/status distribution.

All sixteen CompactPCI slots accept any standard 6U CompactPCI board or transition module which meet IEEE 1101.1, IEEE 1101.10, and IEEE1101.11 specifications. The slots are 64-bit, 33 MHz PCI compliant.

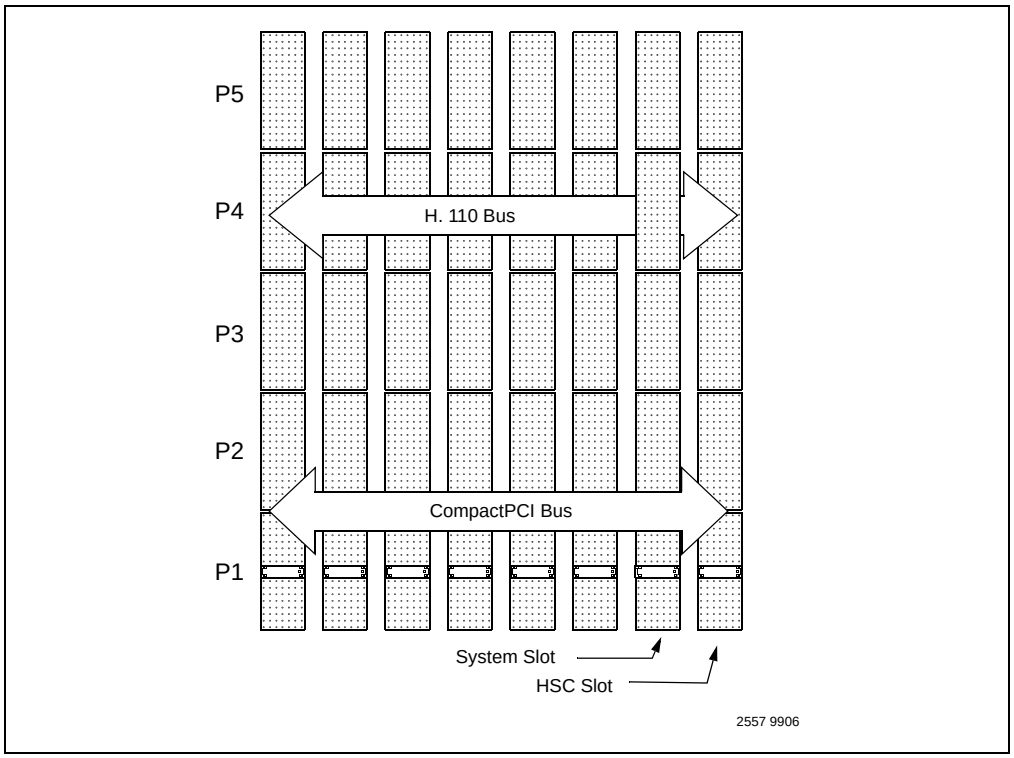
Figure 3-5. CPX8216/CPX8216T Backplane - Primary Side



H.110 Bus Connectors—CPX8216T Chassis Only

On each domain, the H.110 bus passes through connector P4 across the I/O and HSC slots. It does not connect to the CPU slot.

Figure 3-6. The CPX8216 H.110 Bus

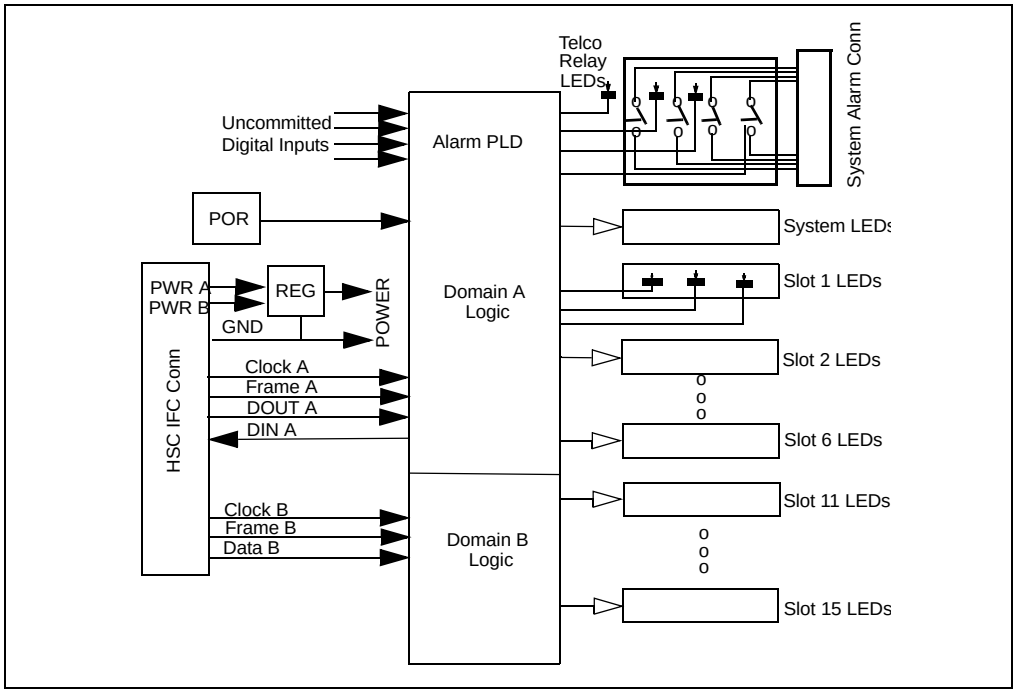


Alarm Display Panel

The alarm display panel provides the chassis LEDs and remote alarm functions for the CPX8216 and the CPX8216T. It is powered and controlled from each of the two Hot Swap Controllers within the chassis (see Figure 3-7).

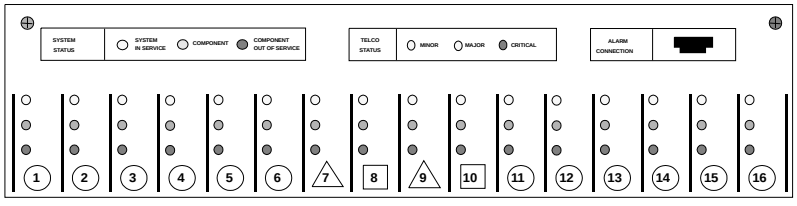
In order to provide a uniform appearance, without depending on individual board manufacturers, the CPX8216 contains a separate alarm display panel, which runs across the top of the chassis. In addition to In Service/Out of Service LED indicators for all sixteen slots, the alarm display panel contains LEDs for system status (System in Service/Component out of Service/System out of Service) and for the three standard Telco levels (Critical/Major/Minor). The three Telco alarms are also signalled through a dry contact relay.

Figure 3-7. Alarm Display Panel Block Diagram



The alarm display panel features three system status LEDs, three Telco alarm status LEDs, three slot status LEDs for each slot, and an RJ-45 connector for Telco alarm status output to an external interface (see the following figure). Normally, only two of the three slot status LEDs are visible—the third is covered by the panel's overlay.

Figure 3-8. Alarm Display Panel - Front View



The alarm display panel LEDs are controlled by bits in the Hot Swap Controller's register, which are set by the system software. This allows full user customization of alarm event reporting. The next table provides the color and standard nomenclature for the LEDs on the alarm panel.

Table 3-1. Alarm LED Color and Description

Alarm	LED Color	Description
Controller Board Slot Status	Green	In Service
	Yellow	N/A (or Out of Service)
	Red	Out of Service
System Status	Green	System In Service
	Yellow	Component Out of Service
	Red	System Out of Service
Telco Status	Yellow	Minor
	Red	Major
	Red	Critical

Power/Fan Modules

The CPX8216 chassis requires a minimum of two power/fan sled modules and a fan-only sled module to provide adequate power and cooling for a fully loaded, nonredundant chassis. The chassis can contain a third power supply/fan sled as part of an N+1 strategy, meaning that the chassis can continue providing service if one of the modules fails.

Both AC and DC input power versions are available. Only one type (either AC or DC) can be installed in a chassis at a time—AC and DC power supplies cannot be mixed in a single chassis. Input power is brought in through a power distribution panel in the rear of the chassis. The type of power distribution panel must match the type of power supply/fan units installed in the chassis. For example, an AC power distribution panel used with AC power supplies, and DC with DC power supplies.

The AC and DC power supplies are mounted on a sled along with the replaceable cooling fans and are discussed in Chapter 9, *Subassembly Removal and Installation*.

The fans run at either high speed (default) or temperature controlled, which can be changed using the operating system software via the API.

For the power coupling to the backplane, refer to the information in *Power Supply Connectors (PS1, PS2, PS3)* on page 127. For the electrical specification for the power supply, refer to *Power Supply Electrical Specifications* on page 133.

Power Distribution Panel

The power distribution panels, located in the rear of the chassis below the transition module card cage, distribute the AC or DC input power to the chassis' power supplies.

The following section describes the characteristics of the AC and DC power distribution panels for CPX8216 and CPX8216T chassis. The CPX8000 series chassis provides for the following power inputs.

- Single Input AC
- Dual Input DC
- Dual Breaker DC
- H.110 Dual Input DC

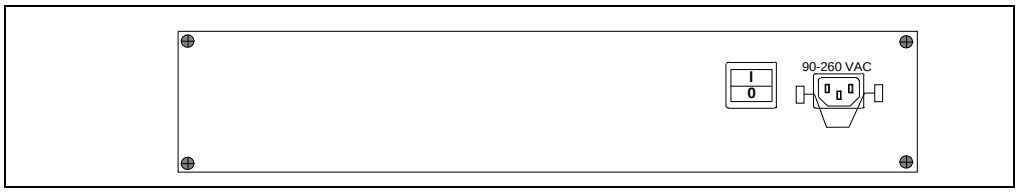
Warning

This subassembly is not a field replaceable unit. Regulatory guidelines do not allow the replacement or repair of MXP power distribution panels by the customer. Replacement and repair must be managed by the Emerson Field Service Organization (FSO) so the warranty and regulatory limbless are not voided. Please contact your Emerson sales representative.

AC Power Distribution Panel (CPX8216)

This section describes the different power distribution panels available on the CPX8000 Series chassis. For information on power hookup, refer to Chapter 5, *Chassis Installation*. The AC version of the panel is shown in the figure below.

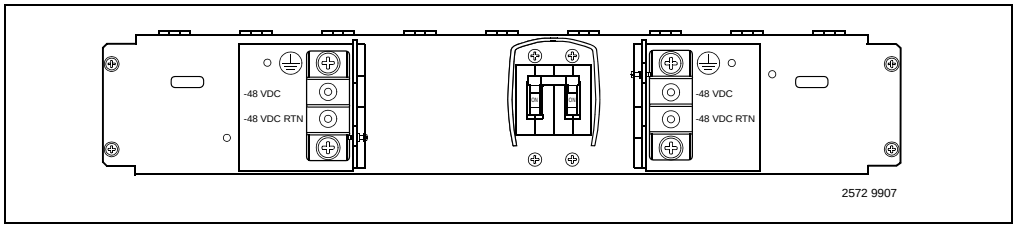
Figure 3-9. AC Power Distribution Panel



Dual Input DC Power Distribution Panel (CPX8216)

The dual input DC version allows redundant input power supplies for full high-availability applications. It is recommended that each input source be independent of the other.

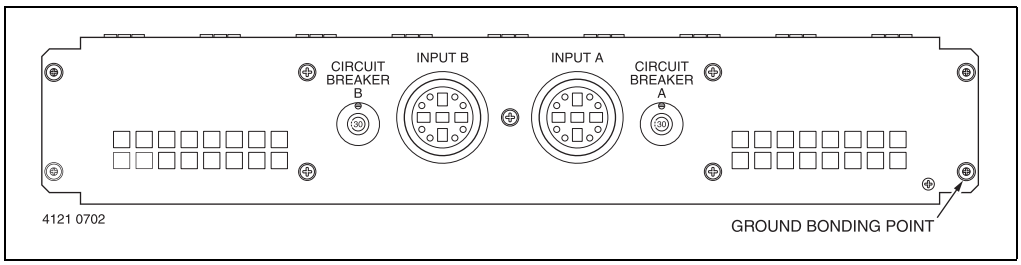
Figure 3-10. Dual Input DC Power Distribution Panel



Dual Breaker DC Power Distribution Panel (CPX8216)

The dual breaker 48VDC version also allows redundant input power supplies for full high-availability applications. It is recommended that each input source be independent of the other. This power distribution panel has two 30A push/pull circuit breakers and is designed for use with a Smart cable that includes breakers and additional circuitry that detect the failure of a single input DC power supply.

Figure 3-11. Dual Breaker DC Power Distribution Panel



The dual breaker DC power distribution panel is available without the two 30A circuit breakers, provided that circuit breaker protection is provided elsewhere and there is allowance for a rating of 30A for each feed.

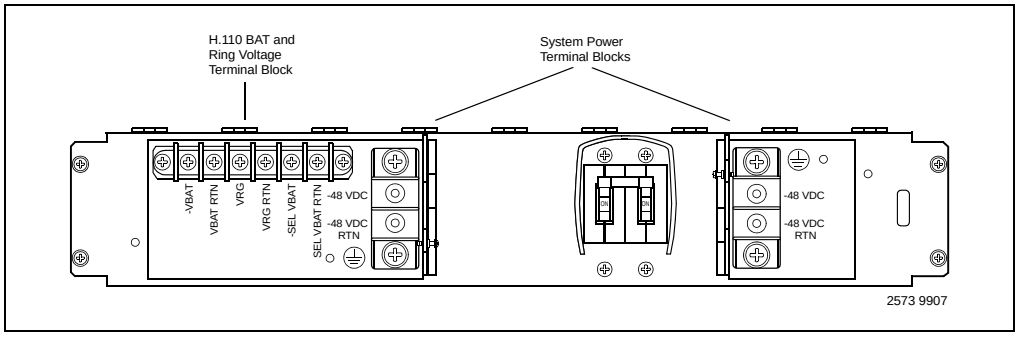
H.110 DC Power Distribution Panel (CPX8216T)

The H.110 DC power distribution panel provides dual DC input for chassis power as well six additional power input connectors for the H.110 BAT and Ring Voltages. The H.110 DC power distribution panel is only compatible with the CPX8216T chassis.

Caution

The six H.110 power inputs must only be attached to approved Telephone Network Voltage (TNV) branch circuits. TNV branch circuits must comply with all requirements called for in these safety standards: IEC 950/EN60 950, UL #1950, and CSA #950. Attaching those inputs to non-TNV-approved power sources will cause the chassis to fail compliance with safety regulations and may cause damage to the chassis backplane and chassis components.

Figure 3-12. H.110 DC Power Distribution Panel



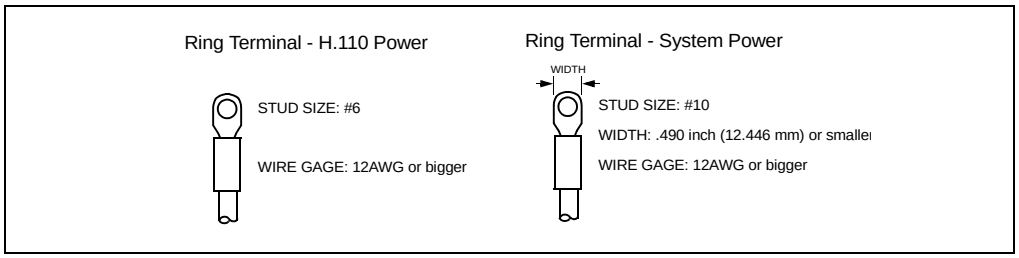
The analog voltages on the H.110 bus are:

Table 3-2. DC Analog Voltages for H.110 Bus

Description	Voltage Inputs
Battery	-48V DC
Return	Nominal 48V, range of 40V to 72V
Ringing	90 VAC nominal
SELV	24V DC nominal, range of <60V

Use 12 AWG or larger wire with a #10 ring terminal to connect the DC chassis power source to the chassis. Use 12 AWG or larger wire with a #6 ring terminal to connect the DC TNV voltages to the H.110 power connectors.

Figure 3-13. Ring Terminal for H.110 DC Voltage


Ring Terminal - H.110 Power
STUD SIZE: #6
WIRE GAGE: 12AWG or bigger
Ring Terminal - System Power
WIDTH
STUD SIZE: #10
WIDTH: .490 inch (12.446 mm) or smalle
WIRE GAGE: 12AWG or bigger

Drive Modules

The CPX8216 contains four hot-swappable peripheral bays, all of which support both SCSI and EIDE protocols.

Caution

The hot swapping of hard drives is supported when your chassis is configured with the appropriate software support for hot swap and when the drives are in a hot swap drive carrier.

SCSI devices can be configured to be fully hot-swappable, and data can be hot switched between two independent SCSI controllers. EIDE devices are assigned to a single EIDE controller. They can be warm swapped, meaning that a failed device can be replaced once the controller has been powered off.

The rear of the CPX8216 chassis may be configured with either single or double, fixed, floppy drives. Floppy drives are not hot-swappable.

For more information on installing both hot-swappable and non-hot-swappable drives, refer to Chapter 8, *Drive Removal and Installation*

Site Preparation

4

Overview

This chapter discusses the proper placement recommendations, environmental conditions, and installation options for the CPX8216 and CPX8216T chassis.

Safety and Regulatory Compliance

The base chassis complies with the safety and regulatory standards applicable to component-level equipment. It is possible to use this product with other components that produce a chassis not in compliance with chassis guidelines. Since Emerson cannot anticipate what equipment may be used with this enclosure or how it may be used, the responsibility for designing a platform that conforms overall to CSA (C/US)/VDE safety requirements and EMI/RFI emission limits rests entirely with the system integrator and installer.

Receiving and Unpacking the Chassis

Receiving the Chassis

You should receive a packing list that lists all the parts shipped with your chassis. Upon receiving the chassis:

- ✓ Compare the packing list with the items you received
- ✓ If the items on the packing list do not match the items received, immediately notify your carrier agent and Emerson
- ✓ Save the shipping cartons for reuse

Unpacking the Chassis

To unpack your chassis, follow these steps.

1. make sure the packing carton is upright.
2. Carefully cut the sealing tape with a box cutter and open the box.
3. Remove the cardboard packing, any foam packing material, and protective plastic.
4. Lift the chassis carefully out of the carton and move it to the location designated for the installation.

Preparing the Site for Installation

This section provides the necessary instructions and information for installing the CPX8216 chassis.

Guidelines for Chassis Location

Before you begin to set up and cable your new chassis, consider these guidelines:

- Locate the chassis in a stable area free of excess movement and jarring
- Install the chassis safely. Ensure that cables and cords are out of the way
- Ensure that the set-up is comfortable for users
- Allow room for proper air flow for cooling
- Locate the computer where it can be easily serviced (front and rear)
- Provide an area free of excess heat, dust, smoke and electrostatic discharge (ESD)

Mounting Options

This chassis has been designed to be mounted in an equipment rack or cabinet while maintaining conformance to the NEBS 24" deep lineup and the ETSI 600mm deep lineup for telecommunication equipment. The types of rack or cabinet in which the CPX8216 can be mounted are listed below:

- 19" or 23" Frame Relay Rack/Cabinet
- 19" or 23" EIA Equipment Rack/Cabinet
- Nonstandard or Proprietary Rack/Cabinet

Refer to Chapter 5, *Chassis Installation* for specific mounting instructions.

Weight Distribution in a Rack

To avoid hazards arising from uneven mechanical loading of the rack, plan your installation so that (within the limitations of equipment and cabling):

- The weight of the equipment is evenly distributed in the rack
- The heaviest units are mounted towards the bottom of the rack

Power Requirements

Power for the rack chassis should come from a totally dedicated circuit breaker. Do not plug any other electrical device into an outlet connected to the circuit breaker serving the rack equipment.

Data loss can occur if the circuit is overloaded and the circuit breaker trips.

Guidelines for Branch Circuits

All branch circuits for the chassis must come from the same circuit breaker panel. Failure to do this can cause power to flow in the data cables interconnecting the various devices of the chassis.

Do not overload branch circuits. Check the manual and/or rating plate of all devices and verify that the sum of the ampere ratings do not exceed two-thirds of the branch rating.

Laser printers and some other devices cause periodic short-duration, heavy loads that do not appear in their ampere ratings. Connect these devices on a separate branch circuit from the chassis.

Using power strips with separate circuit breakers does not add additional protection and may cause unwanted power interruption. Ensure that all power strips use at least #14 AWG with ground.

Note Do not use surge/transient suppressors without careful and expert power system analysis. Most surge/transient suppressors can cause chassis damage from transients if used in the typical manner.

All branch circuits must have a “third wire” type ground for the branch circuit that only goes to the circuit breaker panel. Conduit ground is unacceptable for any portion of the system.

Blinking lights or fluctuating intensity from lighting at the computer site indicate poor power. This may be a cause of system hang-ups. Check the electrical installation to ensure proper operation.

Note Failure to observe proper grounding practices may cause a variety of noise, electrostatic discharge, and radio frequency interference problems.

Power Circuit Protection

Protect the power circuit with an electrical line filter that prevents voltage spikes from reaching the system.

Circuit Breakers and Receptacles

Make sure circuit breakers furnishing power to the system are the correct size to protect the system. Make sure all receptacles are wired for three-wire power distribution (line, neutral, and ground).

All power receptacles servicing any equipment that is directly cable-connected to the system must have a single, common grounding point. The ground wire must be at true ground potential with a resistance (measured at the power panel bus) of five ohms or less between the bus bar and earth. The ground wire is the “third wire” type, (not conduit ground).

Power Cords

Emerson chassis have detachable power cords that you can plug in at both the wall socket and the equipment. Place the chassis within six feet of the electric receptacle.

Note Do not use extension cords.

Cables

The CPX8216 chassis, console, and some other peripherals use shielded cables. You can successfully use shielded cables for communication over extended distances. Reliable communication over cables longer than 50 feet, however, depends on the absence of electrical noise, correct ground potentials at termination points, and other variables.

Cable Planning

When planning the installation of cables, follow these guidelines.

- Do not run signal cables parallel to AC power cables if they are within four inches of each other
- Do not install signal cables close to electric motors, power line regulators, relays, or power supplies
- Avoid laying signal cables close to air conditioners, copy machines, water coolers, and other similar equipment that generates power line “noise”
- Do not run signal cables near equipment that generates radio frequency interference (for example, radio transmitters)
- Do not expose cables to moisture or heat. If you install signal cables outdoors, use a conduit or raceway to protect them from lightning and weather.
- Use shielded cable to ensure radio frequency compatibility
- Use the shortest possible cable between the single-board computer and peripherals
- To ensure maximum protection for equipment and operators, check the protective grounds at each power outlet to make sure they are adequate
- Protect external interconnecting cables from physical damage without endangering users. Install the cables under a raised floor, if possible. Avoid tight pulls against sharp corners.

Caution

To avoid the possibility of damage to equipment or components during cabling, unplug all other devices in the chassis before you begin the installation of any additional units.

Environmental Considerations

When installing the chassis in a particular environment, keep the environmental specifications of the chassis in mind, you can refer to Appendix A, *Specifications* for more information. For example, floppy and hard disk drives typically do not operate reliably above 50º C (122º F) ambient temperature. In an enclosed environment, you need to consider the internal temperature rise over the worst case external ambient temperature.

Enclosure Cooling Considerations

It is essential to properly cool all of the equipment used in a rack mounted chassis. The components of the chassis require an input air temperature nominally below 45º C (113º F). Three internal DC powered fans cool the chassis' drives, CompactPCI modules, and transition modules. To ensure adequate cooling:

- Allow at least two inches of space at the front and back of the chassis
- Make sure all panels are in place
- Fill or cover all module slots (use filler panels in empty slots)
- Airflow in an open frame rack must be from front to rear
- Airflow in an enclosed cabinet must be from front to rear, bottom to top

Chassis Installation

5

Overview

This chapter discusses the installation options for the CPX8000 Series Platforms. The following topics are discussed in this chapter.

- *Tools You Will Need*
- *Mounting Hole Locations*
- *Mounting Dimension for a 19" Frame Relay or EIA Rack*
- *Mounting Dimension for a 23" Frame Relay or EIA Rack*
- *Installing the Chassis in a Frame Relay Rack/Cabinet*
- *Installing the Chassis in an EIA Equipment Rack/Cabinet*
- *Connecting the Chassis Cables*

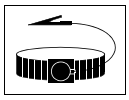
Tools You Will Need

You will need the following tools to complete the installation:

- Torque wrench
- Phillips head screwdriver #1
- Phillips head screwdriver #2

Electrostatic Discharge (ESD) and Safety Procedures

Use ESD



Wrist Strap

Emerson strongly recommends that you use an antistatic wrist strap and a conductive foam pad when installing or upgrading a chassis. Electronic components, such as disk drives, computer boards, and memory modules, can be extremely sensitive to electrostatic discharge (ESD). After removing the component from its protective wrapper or from the chassis, place the component flat on a grounded, static-free surface (and, in the case of a board, component side up). Do not slide the component over any surface.

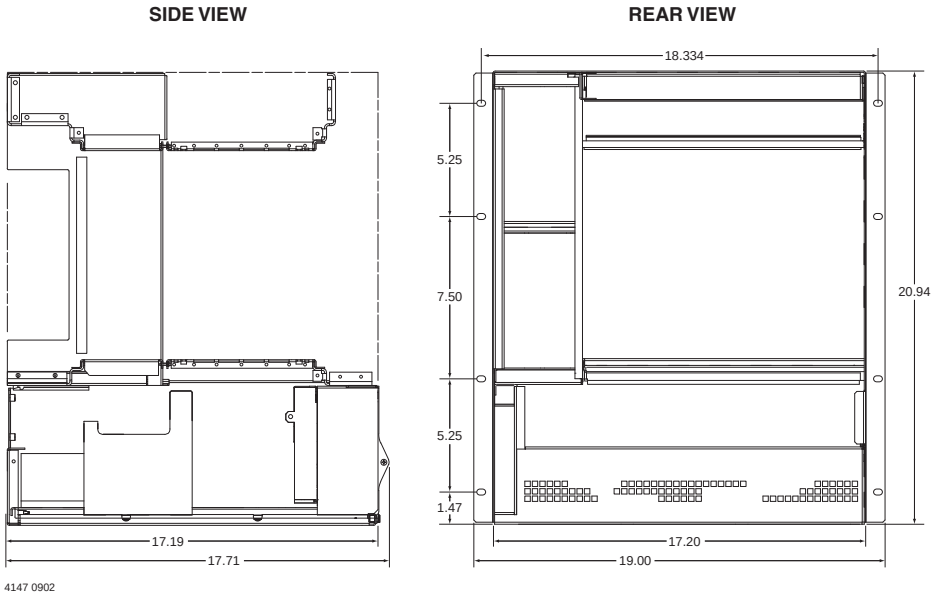
If an ESD station is not available, you can avoid damage resulting from ESD by wearing an antistatic wrist strap (available at electronics stores) that is attached to an active electrical ground. Note that a chassis may not be grounded if it is unplugged.

Note The CPX8216 has one ESD bonding point on the front of the chassis, and one on the back of the chassis.

Mounting Hole Locations

This section provides mechanical drawings to aid in determining the correct mounting brackets and locations for your application. Included is information on the 19" and 23" EIA or frame relay rack/cabinets.

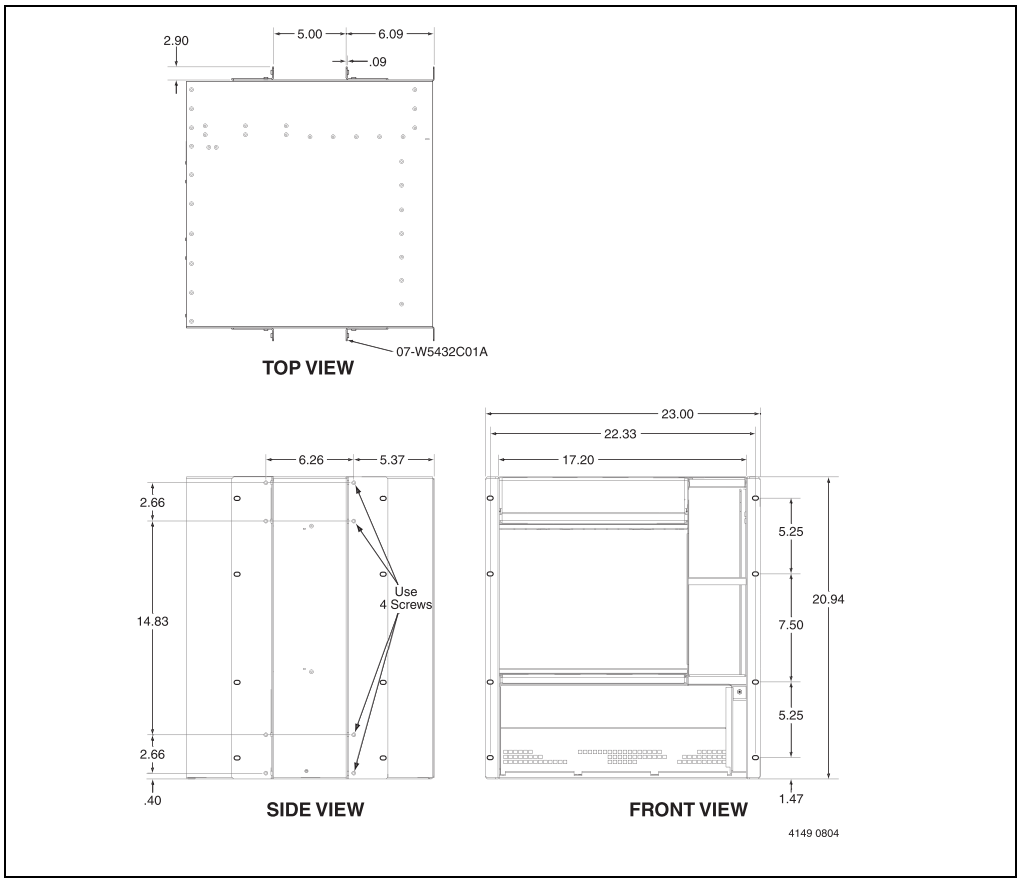
The following illustrations show typical mounting hole locations on the rear and side views of the chassis enclosure.



Mounting Dimension for a 19" Frame Relay or EIA Rack

The next illustration shows the mounting hole locations and the positioning of the brackets for mounting a chassis in a 19" frame relay rack/cabinet.

Figure 5-1. 19" Rack Mounting Dimensions

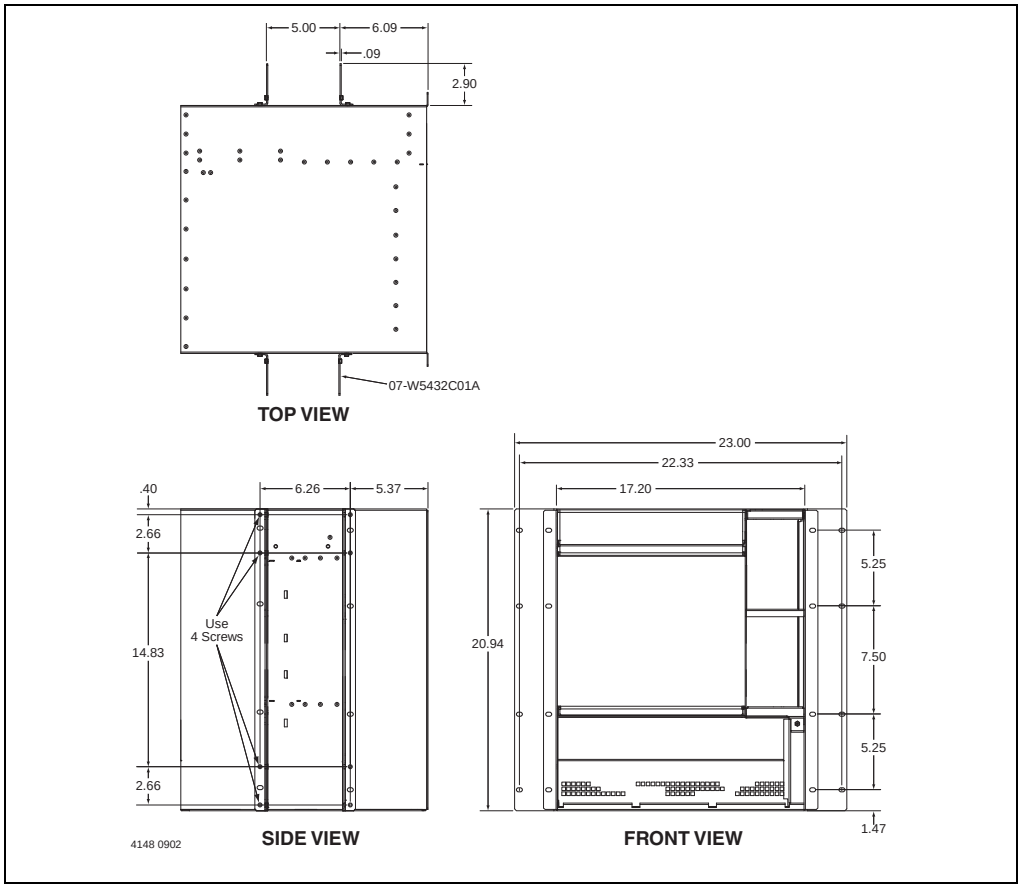


Mounting Dimension for a 23" Frame Relay or EIA Rack

The next illustration shows the mounting hole locations and the positioning of the brackets for mounting a chassis in a 23" frame relay rack/cabinet.

Note When mounting the chassis in an EIA equipment rack, extension brackets need to be obtained from your rack manufacturer.

Figure 5-2. 23" Rack Mounting Dimensions



Weight Distribution Within a Rack

To avoid hazards arising from uneven mechanical loading of the rack, plan your installation so that (within the limitations of equipment and cabling):

- The weight of the equipment is evenly distributed in the rack
- The heaviest units are mounted near the bottom of the rack

Installing the Chassis in a Frame Relay Rack/Cabinet

The CPX8216 chassis can be mounted in either a 19" or 23" Frame Relay rack/cabinet, which are common in Central Office locations. In this configuration, the CPX8216 is held along the center of the rack with optional mounting brackets, providing a balanced weight distribution on the chassis and aiding in reliability of the chassis when subject to earthquake, shock, or vibration.

A separate mounting bracket kit is required to attach the CPX8216 chassis to the Frame Relay rack/cabinet. The same kit is used for either 19" or 23" wide racks/cabinets. The kit includes four (4) mounting brackets and 16 screws (10-32). Kits can be ordered from your local Emerson sales office or distributor.

Mounting Bracket Part #	Fits Rack/Cabinet	Notes
CPX8216RKMT5E	19" or 23" Frame Relay	Channel width - 5" Mid mount
CPX8216RKMTN5E	23" EIA	Channel width - 5" Mid mount

The installation steps are listed below.

1. Locate the correct mounting holes by positioning the bracket against the rack and line up the four vertical mounting holes.

Note This step should be performed before attaching the brackets to the chassis.

2. Attach two front mounting brackets to the front mounting holes located on the sides of the CPX8216 chassis (see the figure on page 38). Use a torque setting of 7 in.-pounds.
   - For 19" racks, the long side of the bracket should be fastened to the chassis
   - For 23" racks, the short side of the bracket should be fastened to the chassis

Warning

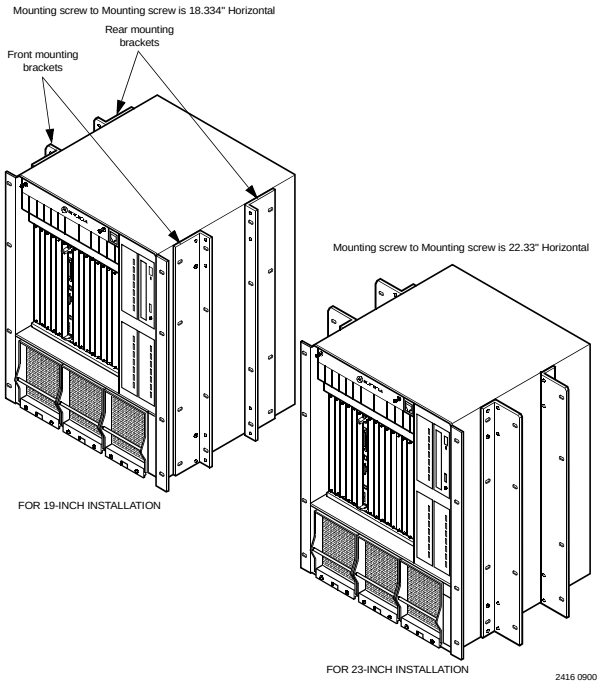
Do not mount the chassis at the top of the rack. A top-heavy rack can tip, causing damage to equipment and injury to personnel.

Two people should perform the following procedure to avoid personal injury or damage to the equipment.

3. Slide the CPX8216 chassis into the front of the rack.
4. Attach the chassis to the rack using eight Phillips head screws that came with the bracket kit. Do not tighten these screws until the back brackets are installed. Be sure to mount the chassis with metal screws or bolts that give a good electrical connection between the screws or bolts and the mounting surface.

Note Failure to observe proper grounding practices may cause a variety of noise, electrostatic discharge, and RFI (Radio Frequency Interference) problems.

5. Attach two mounting brackets to the rear mounting holes on the sides of the CPX8216 chassis (see the figure on page 38).
   - For 19" racks, the long side of the bracket should be fastened to the chassis
   - For 23" racks, the short side of the bracket should be fastened to the chassis
6. Secure the rear mounting bracket to the rack with the remaining eight Phillips head screws. Be sure to mount the chassis with metal screws or bolts that give a good electrical connection between the screws or bolts and the mounting surface.
7. Tighten all screws using a torque setting recommended by the rack/cabinet manufacturer.


Mounting screw to Mounting screw is 18.334" Horizontal
Rear mounting brackets
Front mounting brackets
Mounting screw to Mounting screw is 22.33" Horizontal
FOR 19-INCH INSTALLATION
FOR 23-INCH INSTALLATION
2416 0900

Installing the Chassis in an EIA Equipment Rack/Cabinet

The CPX8216 can be mounted in a 19" or 23" EIA equipment rack/cabinet. If installing the chassis in a 19" rack/cabinet, no additional mounting equipment is necessary.

The preferred method of mounting the CPX8216 chassis is to use the mid-mount brackets, as seen in the previous illustration. However, the CPX8216 chassis may be mounted in an EIA equipment rack/cabinet using only the front mounting flange ears. This method is intended only for lab use and does not meet the vibration, shock, or earthquake NEBS/ETSI specifications stated in Appendix A, *Specifications*.

If installing the chassis in a 23" rack/cabinet, you will need to obtain extension brackets from your rack/cabinet manufacturer.

1. If installing the chassis in a 23-inch rack/cabinet, install the optional extension brackets as described by your rack/cabinet manufacturer.

Warning

Do not mount the chassis at the top of the rack. A top-heavy rack can tip, causing damage to equipment and injury to personnel.

Two people should perform the following procedure to avoid personal injury or damage to the equipment.

2. Slide the CPX8216 chassis into the front of the rack.
3. Attach the chassis to the rack with eight Phillips head screws. Be sure to mount the chassis with metal screws or bolts that give a good electrical connection between the screws or bolts and the mounting surface. Use screws and a torque setting recommended by the rack manufacturer.

Note Failure to observe proper grounding practices may cause a variety of noise, electrostatic discharge, and RFI (Radio Frequency Interference) problems.

Connecting the Chassis Cables

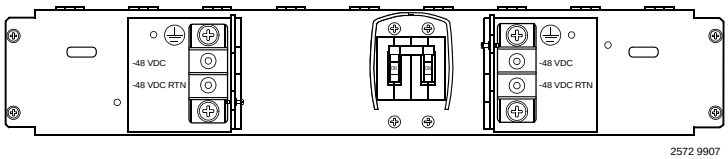
Often, to avoid damage during shipping, all external cables are removed before packing. Refer to the following illustrations and instructions to connect the cables to the chassis.

Connecting the Chassis Power Source

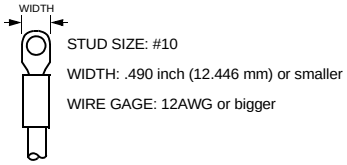
Follow these steps to connect your chassis to either AC or DC power.

Note You can find more information on the power distribution panels and cabling requirements for the CPX8216 in Chapter 3, *Platform Description*

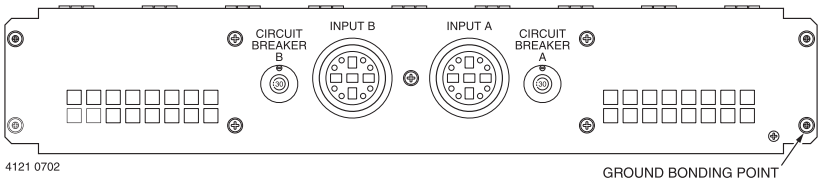
1. For AC chassis, plug the socket end of the chassis power cord (packed with your chassis) into the AC power distribution inlet on the rear of the chassis. Plug the other end into the AC power source.
2. For CPX8216 standard dual input DC chassis, clamp the DC leads to the terminal blocks on the power distribution panel on the rear of the chassis. Each terminal block should be connected to a separate power source. The DC leads should be 12 AWG gauge or larger and should be terminated with a #10 Ring terminal.



Ring Terminal



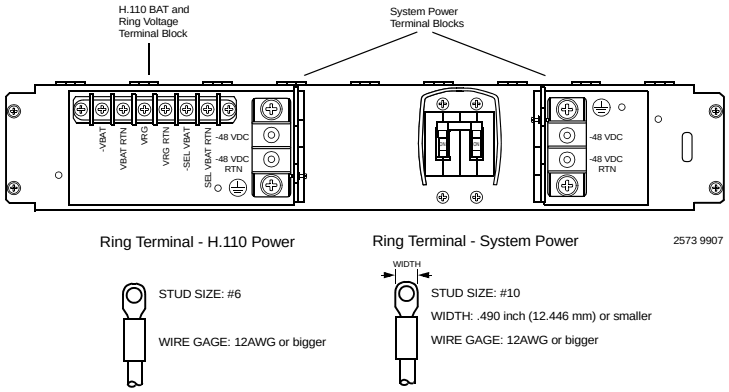
For CPX8216 dual breaker DC chassis, attach the DC cables to the connectors A and B on the power distribution panel on the rear of the chassis. Each power input should be connected to a separate power source.



Use either a standard DC Smart cable or the optional right-angle Smart cable (for limited space requirements) to connect the DC power source to the chassis. Cable length is 10 feet.

Part Number	Cable Description
CPX8200SMTCON5E	HA, DC Smart cable
CPX8200SMTCBL15E	Right-angle DC Power Sense Cable

3. If you are cabling a CPX8216T chassis, connect the H.110 BAT and Ring voltage connectors to an approved TNV voltage source. Use 12 AWG for the power leads terminated with #6 ring terminals.



Caution

The six H.110 power inputs must only be attached to approved Telephone Network Voltage (TNV) branch circuits. TNV branch circuits must comply with all requirements called for in these safety standards: IEC 950/EN60 950, UL #1950, and CSA #950. Attaching those inputs to non-TNV approved power sources will cause the chassis to fail compliance with safety regulations and may cause damage to the chassis backplane and chassis components.

4. Make sure all power leads are fastened securely to the power distribution panel.

Connecting a SCSI Cable

Follow these steps to connect a SCSI cable to the chassis.

1. Make sure the ON/OFF power switch on the back of the chassis is set to OFF (O).
2. Attach the SCSI controller cable.

These steps apply to both chassis domains:

3. Connect one end of the SCSI cable (included with the chassis) to the SCSI controller (see page 41)
4. Pass the free end of the cable through the chassis's cable pass-through

5. Attach the other end of the SCSI cable to the SCSI connector on the back of the floppy housing

Note Typically, the Domain A SCSI controller cable will attach to the upper SCSI connector, and the Domain B SCSI controller cable will attach to the lower connector (if present). Your chassis may be configured differently.

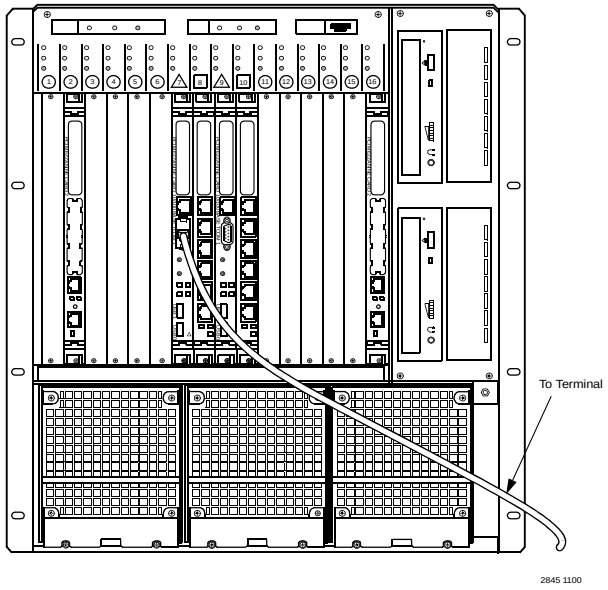
Connecting a Serial Console

This section will help

Different boards used with the CPX8216 platform may have different console interfaces and defaults. Please confirm your serial configuration defaults (baud rate, terminal type, flow control, etc.) for the board you are using.

If using the chassis with a terminal interface, connect the terminal to the COM1 port on either the host controller module or the rear transition module.

Note Only one of the two COM1 ports may be used at a time.



Connecting Video, Keyboard, and Mouse

If using the chassis with a monitor, keyboard, and mouse, the CPX8216 must be equipped with an optional PMC expansion carrier and video PMC module.

1. Connect one end of the monitor (video) cable into the port on the monitor (not necessary if your monitor comes with the cable attached) and the other end to the video connector on the front of the video PMC module.

2. Connect the single end of the keyboard and mouse adapter cable into the keyboard/mouse port on the rear transition module.

3. Connect the keyboard and mouse cables into the correct ports on the split end of the keyboard and mouse adapter cable.

   Plug all power cords into a grounded, surge-protected power source.

Chassis Operations

6

Overview

This chapter provides the basic operating procedures for the CPX8216 chassis. For software-specific information or information regarding the operation of third-party and add-on components, please refer to the product's vendor documentation. This chapter covers the following major topics:

- *Recommended Power-On Procedures*
- *Recommended Power-Off Procedure*
- *Emergency Power-Off Procedure*
- *Controls and Indicators*
- *Setting the Chassis ID on the CPX8216T*
- *Chassis Cooling*
- *Power Monitoring*

Recommended Power-On Procedures

Follow this procedure to power-on your chassis.

1. Verify that all chassis modules and associated data and control cables are properly configured and installed.
2. Verify that the chassis configuration's current loads do not exceed the power supplies' limits.

   The maximum current load of the chassis depends upon the configuration of the chassis and can be determined from the following table which shows the single power supply output.

Voltage	Regulation	Minimum Load	Maximum Load*
+5V	±3%	0.0A	40.0A
+3.3V	±3%	0.0A	40.0A
+12V	±5%	0.0A	10.4A
-12V	±5%	0.0A	4.0A
**Total combined output loading not to exceed 400W.*			

3. Verify that the chassis is connected to the AC or DC input power.

Note The voltage on the rating label adjacent to the power receptacle must agree with the type of line or cord and the applied voltage.

4. Flip the rocker switch in the rear of the chassis to | (ON).

Recommended Power-Off Procedure

To shut down your CPX8216 chassis, follow these steps.

1. Shut down all software operations and the operating system. For dual-configured chassis, both domains must be shut down.
2. Flip the rocker switch in the rear of the chassis to O (OFF).

   This removes input power for all the power supplies. In dual-configured chassis, both domains will lose input power.

Emergency Power-Off Procedure

Caution

Performing this step results in a loss of data and may cause damage to chassis components in a running chassis. Use the following step only when normal shutdown procedures cannot be followed.

This step applies to both AC and DC chassis.

In the event of an emergency, flip the rocker switch in the rear of the chassis to O (OFF). This removes input power from the power supplies and will result in an abnormal shutdown of the chassis.

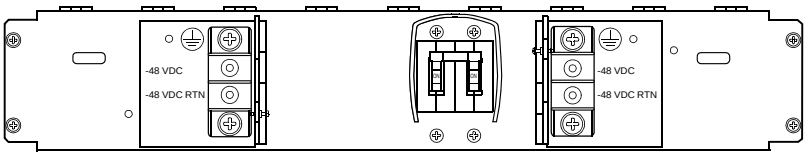
Controls and Indicators

This section describes the various locations and functions of the controls and indicators of the CPX8216 chassis. The controls and indicators for the various CompactPCI modules available for the platform are not covered in this section, refer to Chapter 3, *Platform Description* for this information.

Input Power Rocker Switch

The input power rocker switch is located on the Power Distribution Panel at the rear of the chassis. See the following figure.

Figure 6-1. Input DC Power Rocker Switch



It has two states: ON and OFF.

- Turning the switch ON (|) supplies power to the chassis' power supplies
- Turning the switch OFF (O) removes input power from the chassis' power supplies

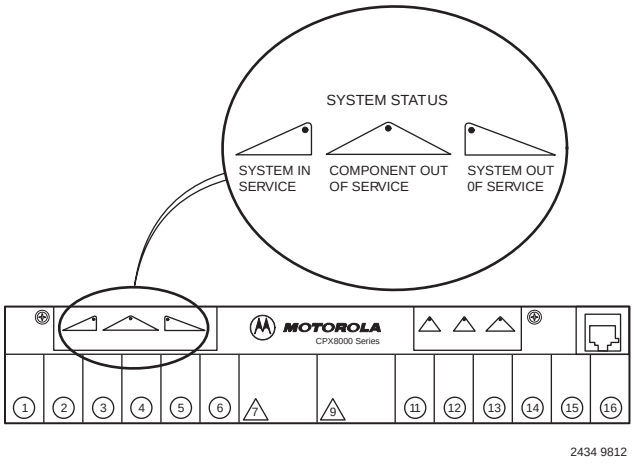
Indicators

All LED indicators, except for the drive activity light on the hot-swap drive modules, are controlled by the system software and are user-configurable. Refer to your system software documentation for information about LED activity and configuration.

System Status Indicators

The system status LEDs are located in the upper-left corner of the alarm board. See the following figure.

Figure 6-2. System LED Location



These indicators are controlled by the system software and are configured by the user. The following table provides the color scheme for the system status indicators.

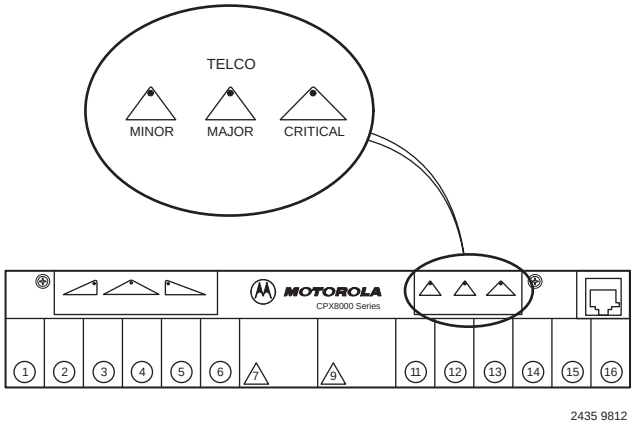
Table 6-1. System Status Indicators

LED	Color
System In Service	Green
Component Out of Service	Yellow
System Out of Service	Red

Telco Alarm Indicators

The Telco alarm LEDs are located in the upper-right corner of the alarm board as shown in the next figure.

Figure 6-3. Telco Alarm Indicator Location



The next table provides the LED color scheme of the Telco alarm indicators. The LEDs and alarms are controlled by the system software and are configured by the user.

Table 6-2. Telco Alarm Indicators

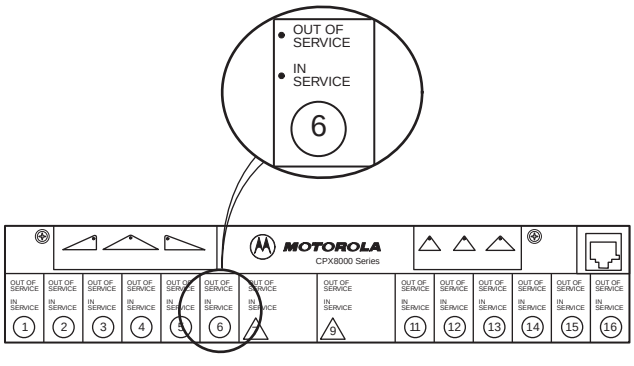
LED	Color
Minor	Yellow
Major	Red
Critical	Red

CompactPCI Slot Status Indicators

Each CompactPCI slot has three status indicators located above it on the alarm board.

Note An overlay covers the bottom LED and makes two LEDs visible to the user.

Figure 6-4. Slot Status Indicator Location



The next table provides the color scheme for these indicators:

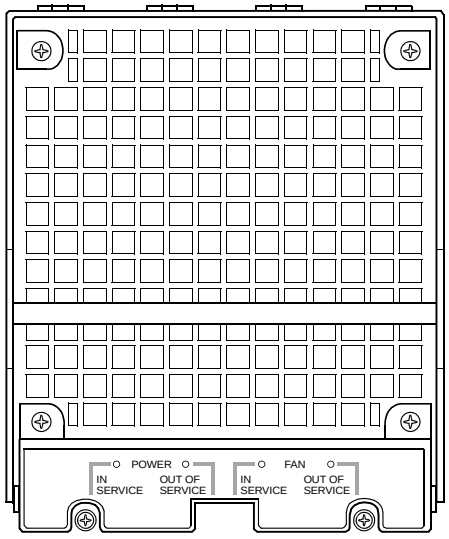
Table 6-3. CompactPCI Slot Status Indicators

LED	Color
Out of Service	Red
In Service	Green
N/A	Yellow (not visible with the standard alarm panel overlay)

Power Supply/Fan Indicators

Each power supply/fan is equipped with four status LEDs on the front panel.

Figure 6-5. Power Supply/Fan Status Indicators



The next table describes the functions of each power supply LED.

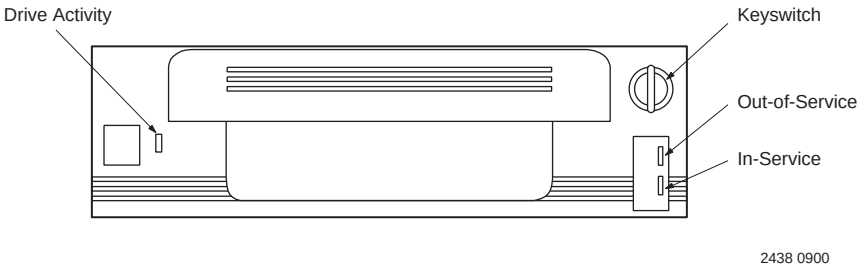
Table 6-4. Power Supply/Fan Status Indicators

Power LED	**Color**
In Service	Green
Out of Service	Red
Fan LED	**Color**
In Service	Green
Out of Service	Red

Drive Indicators

The drive status indicators are located on the front of the hot-swap drive carrier (they are not available on drives mounted in a standard carrier).

Figure 6-6. Drive Status Indicators



The next table provides a functional description of the drive LED activity.

Table 6-5. Drive Status Indicators

LED	Color	Description
Drive Activity	Yellow	Illuminates when the drive is engaged. This LED is controlled by the drive.
In-Service*	Green	Illuminates when the drive is installed and enabled (the keyswitch closed). This LED is controlled by the system software.
Out-of-Service*	Yellow	Illuminates when the drive is taken out of service. This can be due to a drive failure or to opening the keyswitch for drive swapping. This LED is controlled by the system software.
*These LEDs are controlled by the system software. This table describes the typical configuration. Your drive's status LED activity may differ.		

Setting the Chassis ID on the CPX8216T

A unique 5-bit chassis ID can be assigned for each CPX8216T chassis. Hex values are on the rotary switches located on the HSC boards. A jumper can be added to J14 to double the number of unique identifiers. This feature should be used if more than 15 chassis are deployed in one location. The HSC boards are shipped with no jumper as the default. Below are some guidelines for setting the chassis ID on your CPX8216T chassis.

- The chassis ID bit 5's value is 1 if no jumper is installed
- The chassis ID bit 5's value is 0 with a jumper installed on J14
- Do not set the chassis ID to 1F (as 11111 is not valid per PICMG 2.5)
- If two HSC boards are being used in the same chassis, they must be set to the same value

The illustration below shows the S2 location of the rotary switch and J14 header.

Figure 6-7. S2 Switch Location and J14 Header

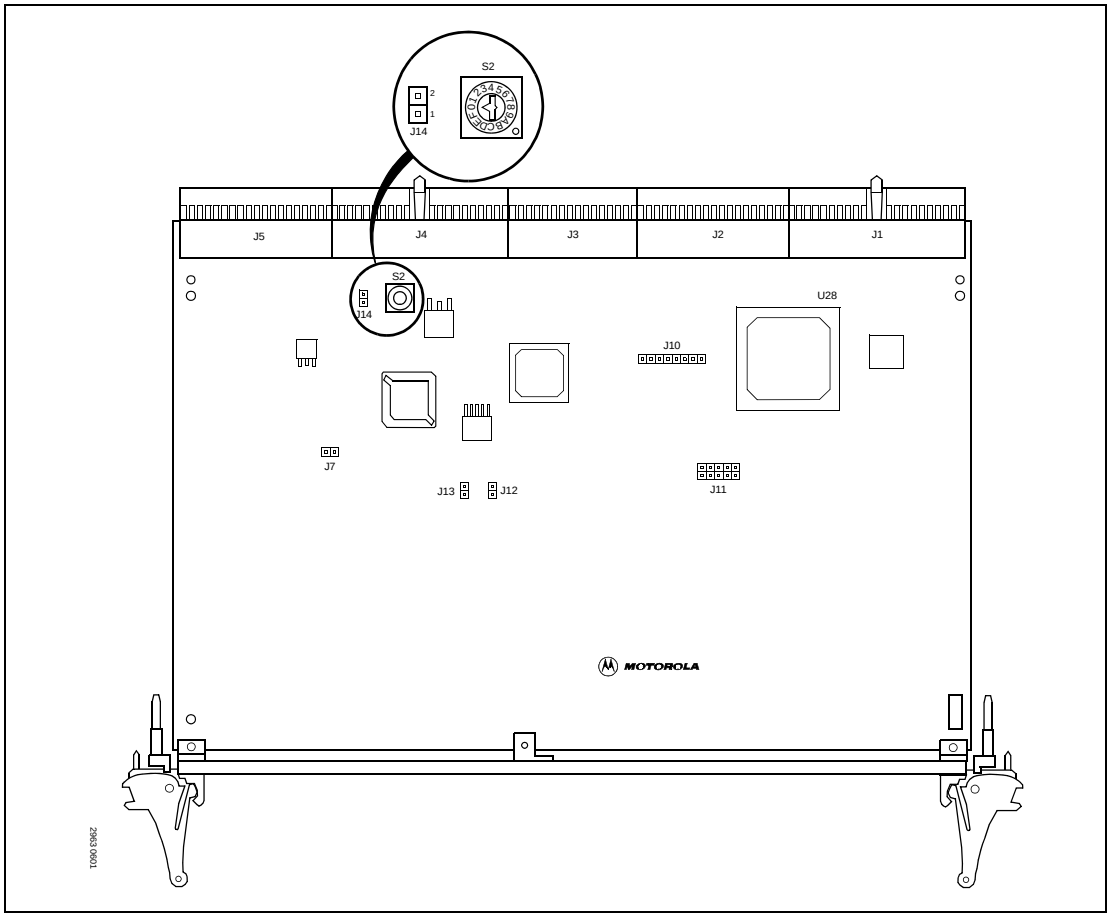


Table 6-6. Chassis ID Settings

J14 Jumper Setting	S2 Rotary Switch Setting	HSC Register Value in Hex
Installed	F	0
Installed	E	1
Installed	D	2
Installed	C	3
Installed	B	4
Installed	A	5
Installed	9	6
Installed	8	7
Installed	7	8
Installed	6	9
Installed	5	A

Table 6-6. Chassis ID Settings (continued)

J14 Jumper Setting	S2 Rotary Switch Setting	HSC Register Value in Hex
Installed	4	B
Installed	3	C
Installed	2	D
Installed	1	E
Installed	0	F
Removed	F	10
Removed	E	11
Removed	D	12
Removed	C	13
Removed	B	14
Removed	A	15
Removed	9	16
Removed	8	17
Removed	7	18
Removed	6	19
Removed	5	1A
Removed	4	1B
Removed	3	1C
Removed	2	1D
Removed	1	1E
Removed	0	1F*
* Use of this setting is discouraged		

Chassis Cooling

Three fans provide forced-air cooling for the chassis power supplies, CPU and I/O controller card cage, transition module card cage, and drive bays, as shown in the following figure. Fans run at either high speed (default) or temperature controlled. The high setting (power-up default) runs until the software changes it. The temperature controlled setting operates with variable fan speeds which varies with temperature, as follows:

Temperature Speed	RPM
<25° C Low	2500
24° to 45° C	Linear increase between 2500 to 3500
>45° C High	3500

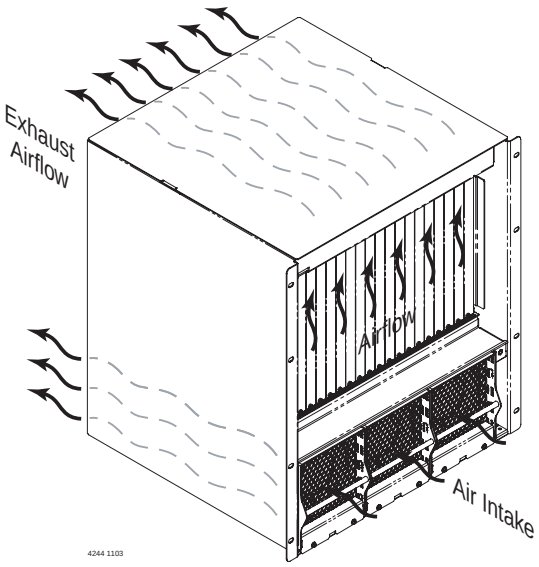
Fans should be put in temperature controlled mode to reduce the noise level of the chassis. This is done using API calls supplied by the operating system software.

The chassis is designed with N+1 cooling. If one fan fails, the chassis may operate at normal operating temperatures up to 45° C air inlet temperature. Note that this is below the maximum operating temperature of 55° C.

The fans are mounted on the front of the fan/power supply sled. In chassis equipped with only two power supplies, the third fan is provided on a fan-only sled.

Refer to *Fan and Power Supply Sled Removal and Installation* on page 93 for information about replacing a fan/power supply sled. Note: Fans must be replaced as a unit.

Figure 6-8. Air Flow Diagram



Air filters are an optional item. Air filters will last for approximately 90 days, depending on the conditions of the Central Office Environment. Check your air filters occasionally to make sure they are not obstructed or damaged, or if they need to be cleaned or replaced. It is recommended that you replace any damaged or obstructed filters. Please see the next section for specific details on the CPX8216's cooling monitoring features.

You can order replacement air filter media (Emerson Part Number 91-W5663C01A) from the following manufacturer. This part number does not include the air filter frame, only the air filter.

Universal Air Filter Company
1624 Sauget Industrial Parkway
Sauget, IL 62202
Phone: (800) 541-3478
Fax: (618) 271-8808

To visit their website for more information, go to http://www.uaf.com.

Cooling Monitoring

Input air temperature is monitored by cooling sensors located on the power supply/fan sled in back of the fan. Two temperature trip points are hard-wired into the sensors.

- When the input temperature rises, either through a failed fan or through an increase in the ambient temperature, and reaches the first trip point, the sensor detects the rise in temperature and sends a warning signal to the system

  At this point, Emerson-supported devices and most other devices in the chassis are approaching their upper temperature limits, but are not in immediate danger of damage. Recovery can be accomplished by either replacing the failed unit or decreasing the ambient temperature.

- If the temperature continues to rise, and second trip-point is reached, the sensor sends a warning that the chassis should be shut down

  At this point, shut down the chassis. Replace failed units and inspect the chassis components for heat damage. Before restarting the chassis, take measures to prevent a recurrence of the over temperature condition.

Power Monitoring

Power supply output voltages are monitored (note, input power is not monitored). The power supply sends a low POWER GOOD# signal to the Hot Swap Controller/Bridge register set when the power outputs are within ±5% of the set voltage. If the output voltages stray out of tolerance, the POWER GOOD# signal is drawn high.

Note Power supply/fan modules are included in Domain A of the CPX8216 architecture. If Domain A is not controlled, all LED updates to the display and power supplies are suspended and monitoring of the alarm input is inhibited.

Installing Boards in the Chassis

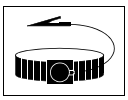
7

Before You Install or Remove a Board

Boards may be damaged if improperly installed or handled. Please read and follow the guidelines in this section to protect your equipment.

Observe ESD Precautions

Use ESD



Wrist Strap

Emerson strongly recommends that you use an antistatic wrist strap and a conductive foam pad when installing or upgrading a system. Electronic components, such as disk drives, computer boards, and memory modules, can be extremely sensitive to electrostatic discharge (ESD). After removing the component from its protective wrapper or from the system, place the component flat on a grounded, static-free surface (and, in the case of a board, component side up). Do not slide the component over any surface.

If an ESD station is not available, you can avoid damage resulting from ESD by wearing an antistatic wrist strap (available at electronics stores) that is attached to an active electrical ground. Note that a system chassis may not be grounded if it is unplugged.

Watch for Bent Pins or Other Damage

Caution

Bent pins or loose components can cause damage to the board, the backplane, or other system components. Carefully inspect your board and the backplane for both pin and component integrity before installation.

ECC and our suppliers take significant steps to ensure there are no bent pins on the backplane or connector damage to the boards prior to leaving our factory. Bent pins caused by improper installation or by boards with damaged connectors could void the Emerson warranty for the backplane or boards.

If a system contains one or more crushed pins, power off the system and contact your local sales representative to schedule delivery of a replacement chassis assembly.

Use Caution When Installing or Removing Boards

When first installing boards in an empty chassis, we recommend that you start at the left of the card cage and work to the right when cards are vertically aligned; in horizontally aligned cages, work from bottom to top.

When inserting or removing a board in a slot adjacent to other boards, use extra caution to avoid damage to the pins and components located on the primary or secondary sides of the boards.

Preserve EMI Compliance

Caution

To preserve compliance with applicable standards and regulations for electromagnetic interference (EMI), during operation all front and rear openings on the chassis or board faceplates must be filled with an appropriate card or covered with a filler panel. If the EMI barrier is open, devices may cause or be susceptible to excessive interference.

Understand Hot Swap

Caution

Inserting or removing non-hot swap cards or transition modules with power applied may result in damage to module components. Make sure that your board manufacturer identifies your module as hot swap ready.

The PICMG 2.1 Hot Swap specification defines varying levels of hot swap. A board that is compliant with the specification can be inserted and removed safely with system power on without damage to on-board circuitry. *If a module is not hot swap compliant, you should remove power to the slot or system before inserting or removing the module.*

To facilitate hot swap, PICMG 2.1 specifies a blue LED on the faceplate. This LED is under software control.

If your system is using software that provides full hot swap capabilities, the software will illuminate the blue hot swap LED on the faceplate when software has stopped and it is safe to remove the board.

If your system does not have hot swap-aware software running, behavior of the blue LED may be indeterminate. In this case, you may need to manually shut down applications or operating systems running on the board prior to board removal, even if the blue LED is lit.

Caution

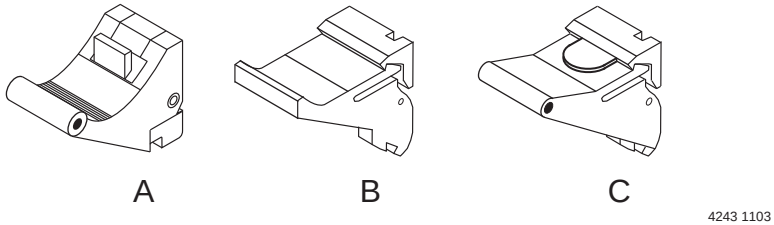
Powering down or removing a board before the operating system or other software running on the board has been properly shut down may cause corruption of data or file systems.

Refer to the documents listed in Appendix C, *Related Documentation* for more information about hot swap and the PCI Industrial Computer Manufacturers Group (PICMG) Hot Swap Specification.

Recognize Different Injector/Ejector Lever Types

The modules you install may have different ejector handles and latching mechanisms. The following illustration shows the typical board ejector handles used with ECC payload cards: (A) Elma Latching, (B) Rittal Type II, (C) Rittal Type IV. All handles are compliant with the CompactPCI specification and are designed to meet the IEEE1101.10 standards.

Figure 7-1. Injector/Ejector Lever Types



Each lever type has a latching mechanism to prevent the lever from being opened accidentally. You must press the lever release before you can open the lever. *Never force the lever.* If the lever does not open easily, you may not have pressed firmly enough on the release. If the lever does not close easily, the board may not be properly seated in the chassis.

To open a lever, press the release and move the lever outward away from the faceplate.

To close a lever, move the lever inward toward the faceplate until the latch engages.

Verify Slot Usage

Caution

Prevent possible damage to module components by verifying the proper slot usage for your configuration.

In most cases, connector keying will prevent insertion of a board into an incompatible slot. However, as an extra precaution, you should be familiar with the glyphs and colored card rails used to indicate slot purpose.

The following table lists the colors and glyphs common to ECC chassis.

Table 7-1. Slot Usage Indicators

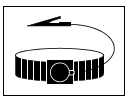
Card Rail Color	Glyph	Usage
Tan	none	**MXP:** Alarm Management Controller slot
		CPX: Hot Swap Controller or Bridge slot
Red		**MXP:** Fabric Switch Card slot
		CPX: System Controller slot
Black		**MXP:** Payload Card slot
		CPX: Non-system Controller or I/O Card slot

Installing a Module

This section describes a recommended procedure for installing a board module in a chassis.

Before you install your module, please read all cautions, warnings, and instructions presented in this section and the guidelines explained in *Before You Install or Remove a Board* on page 57.

Use ESD



Wrist Strap

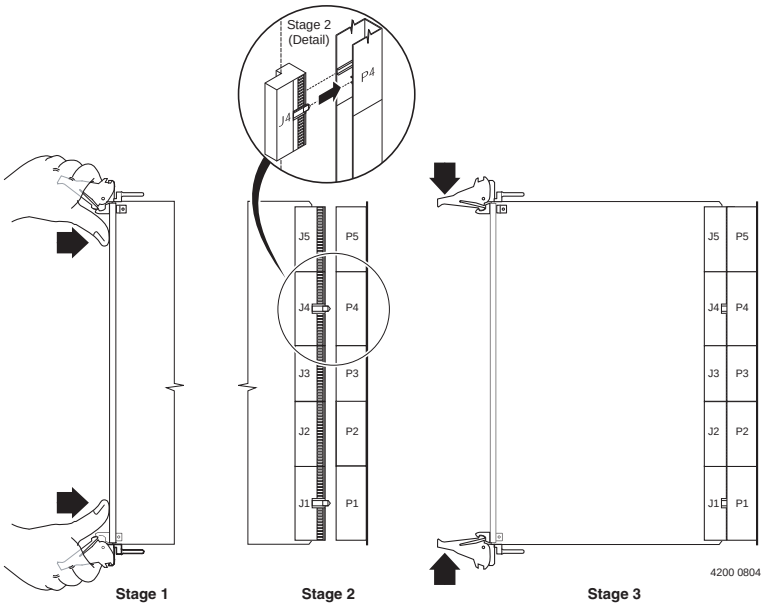
Handling modules and peripherals can result in static damage. Use a grounded wrist strap, static-dissipating work surface, and antistatic containers when handling and storing components.

Caution

Insert the board by holding the injector levers—do not exert unnecessary pressure on the faceplate.

Hot swap compliant modules may be installed while the system is powered on. If a module is not hot swap compliant, you should remove power to the slot or system before installing the module. See *Understand Hot Swap* on page 58 for more information.

Refer to the following illustration and perform these steps when installing modules. Note that this illustration is for general reference only and may not accurately depict the connectors and handles on the board you are installing.



1. Open the injector levers on your board (see *Recognize Different Injector/Ejector Lever Types* on page 59).
2. Verify the proper slot for the module you are inserting (see *Verify Slot Usage* on page 59). Align the edges of the module with the card cage rail guides in the appropriate slot.
3. Using your thumbs, apply equal and steady pressure as necessary to carefully slide the module into the card cage rail guides (Stage 1). Continue to gently push until the prealignment guide pegs engage with the backplane connector (Stage 2) and the injector levers make contact with the chassis rails. *DO NOT FORCE THE BOARD INTO THE BACKPLANE SLOT.*
4. Use the injector levers to seat the module in the slot by closing the levers until they latch into the locked position (Stage 3). If the levers do not completely latch, remove the module from the chassis and visually inspect the slot to ensure there are no bent pins.
5. When the module you are installing is completely latched, secure it by tightening the captive screws at both ends of the faceplate.

Removing a Hot-Swap Module

This section describes a recommended procedure for removing a board module from a chassis.

Before you remove your module, please read all cautions, warnings, and instructions presented in this section and the guidelines explained in *Before You Install or Remove a Board* on page 57.

Hot swap compliant modules may be removed while the system is powered on. If a module is not hot swap compliant, you should remove power to the slot or system before removing the module. See *Understand Hot Swap* on page 58 for more information.

To remove a board module, follow these steps:

1. Loosen the module's captive screws at both ends of the faceplate.
2. Begin to remove your module by unlatching the ejector lever closest to the blue LED (the lower lever on vertically mounted boards). See *Recognize Different Injector/Ejector Lever Types* on page 59. *Do not remove the module immediately.*

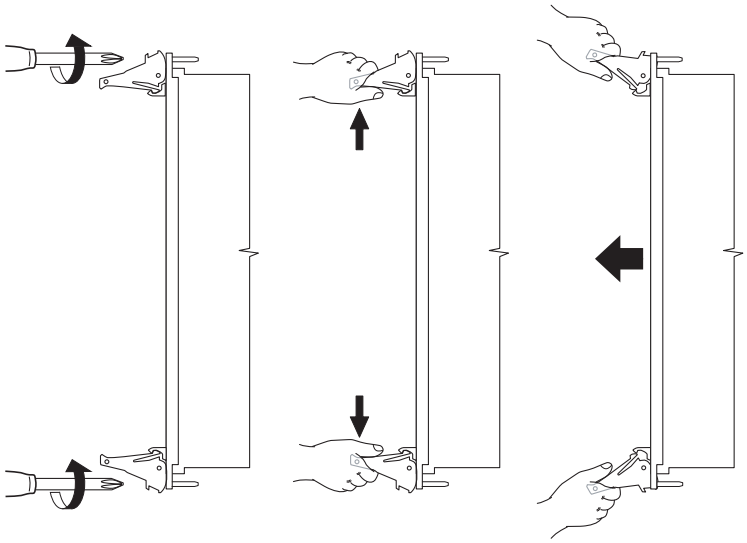
Caution

Powering down or removing a board before the operating system or other software running on the board has been properly shut down may cause corruption of data or file systems.

If your module is hot swap compliant and you are running fully functional hot swap-aware software, unlatching this ejector lever will start the shutdown process on the board. Software will illuminate the blue hot swap LED on the faceplate when it is safe to remove the board.

If your board or system is not running hot swap-aware software, the blue LED may illuminate without regard to software processes still running on the board. Be sure to manually shut down applications or operating systems running on the board prior to board removal. See *Understand Hot Swap* on page 58 for more information.

3. Once the applications and operating system running on the board have stopped and it is safe to remove the board, open both ejector levers to partially unseat the module from the backplane connectors.



4. Carefully pull the module from the chassis.

Installing a Transition Module

Transition modules provide the interface between the standard parallel port, EIDE port, floppy port, keyboard/mouse port, and the serial port connectors, and the CompactPCI Single Board Computer module.All port I/O controllers reside on the Single Board Computer module. All port circuitry on the transition module is passive, except for serial ports 3 and 4, whose circuitry provides multiplexing and buffering functions.

Installation of the transition module is accomplished from the rear of the system chassis. The transition modules are front I/O only and are used in the CPU slots 7 and 9 in the backplane. Any rear panel must be removed in order to see the backplane and install the transition module.

To install the transition module in the system chassis, follow these steps:

1. If the chassis has a rear card cage, remove the filler panel(s) from the card slot 7 and 9 at the rear of the chassis.

Note Make sure that your board manufacturer identifies your module as hot swap ready. If the system software does not support full hot swap capabilities, you will need to shut down the slot via the software before proceeding.

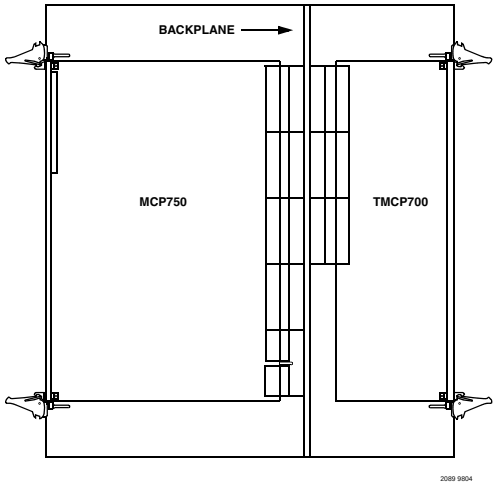
Caution

Connecting modules while power is applied may result in damage to components on the module.

2. If necessary, move some of the other modules to allow space for the cables connected to the transition module.
3. Install the jumper for serial ports 3 and 4, if needed refer to the documentation specific to your transition module.
4. Insert the transition module into the chassis slot making sure the J3/J4/J5 connector pins are properly aligned with the backplane connector pins. Tighten the attaching screws.

Note Make sure there is good contact with the transverse mounting rails in order to minimize RF emissions.

5. Connect the power cable to the AC power source.



For detailed information on configuring your transition module, refer to the manual specific to your hardware.

Drive Removal and Installation

8

Introduction

The CPX8216 is equipped with a front peripheral bay that can accommodate up to four drives of a variety of types: SCSI or IDE, 3.5-inch or 5.25-inch, removable-media or hard disk drives.

The first part of this chapter discusses the hot swapping of IDE and SCSI hard disk drives when the drives are mounted in a hot swap drive carrier and have supporting software for hot swap.

The second part of this chapter discusses the replacement procedures for non-hot swap IDE and SCSI drives. The CPX8216 is also equipped with a rear peripheral bay which supports up to two 3.5-inch floppy or tape drives. Floppy and tape drives are not hot swappable.

This chapter contains the following major topics.

- *Overview of Hot Swapping a Drive*
- *Overview of Carrier Frames*
- *Hot Swap IDE Drives*
- *Installing an IDE Carrier Frame and Assigning Domains*
- *Installing the IDE Hot Swap Drive Module*
- *Hot Swap SCSI Drives*
- *Installing a SCSI Carrier Frame and Assigning Domains*
- *Installing the SCSI Hot Swap Drive Module*
- *Non-Hot Swap Drive Modules*
- *Replacing a Non-Hot Swap 5.25-inch Drive*
- *Replacing a Floppy Drive*

Overview of Hot Swapping a Drive

The first part of this chapter discusses the process for hot swapping a drive module. A drive module consists of a drive carrier and hard drive. To successfully complete this task, you must meet these requirements:

- Have your system configured with the appropriate software support for hot swap
- Have a carrier frame and the appropriate hot swap drive carrier for your hard drive
- Have a hot swap capable hard drive

These procedures for working with hot swap drive modules are covered in the next several sections. Please read this information before attempting to replace your drives.

- *Overview of Carrier Frames*
- *Hot Swap IDE Drives*
- *Hot Swap SCSI Drives*

Overview of Carrier Frames

The carrier frame provides the connectivity between the hot swap drive carrier and the system. There are two types of drive carrier frames, one for SCSI carriers and another for IDE carriers. The carrier frame remains in the chassis when a drive module is hot swapped. It is not removed as part of the hot swap operation.

Removing a Carrier Frame

You need to shut down the operating system and remove the input power before performing these procedures. The carrier frame is not hot swappable. Refer to the illustration on the next page and follow these steps to remove either an IDE or SCSI carrier frame from your chassis.

1. Shut down the system and power off the chassis.
2. Remove the floppy housing from the rear of the chassis. Refer to *Floppy Housing Removal and Installation* on page 98.
3. Detach the signal, power, and SCSI or IDE cables from the rear of the drive carrier frame being removed.

   If not replacing another drive at this time, replace the floppy bay, otherwise leave it off for access to the cables during drive installation.
4. Remove the drive module from the drive frame:
   - Push in the switch key and turn the key counterclockwise 1/4 turn. This unlatches the drive carrier unit from the frame, freeing it for removal
   - Pull the drive module unit straight out of the chassis
5. Remove the front drive bay bezel (loosen the four captive screws in the corners of the bezel and pull the bezel straight from the chassis).
6. Remove the two retaining screws from the top and bottom of the drive carrier frame.
7. Pull the drive carrier frame straight out of the drive bay.

   If not installing another drive module at this time, fill the drive bay with an unpopulated standard drive carrier or filler panel.

Hot Swap IDE Drives

This section provides information specifically for the IDE drive. It details the procedures for: installing and cabling an IDE carrier frame, setting domains, and installing an IDE drive into an IDE drive carrier, and finally installing the drive module in the chassis.

Installing an IDE Carrier Frame and Assigning Domains

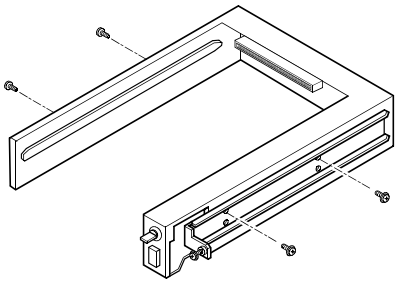
IDE hot swap carrier frames are identified by a gold keyswitch on the front of the carrier and an IDE connector on the rear of the carrier.

To configure and install the carrier frame in your system, follow these steps.

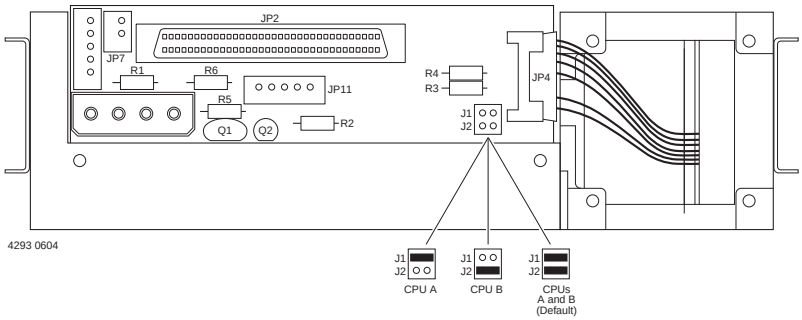
1. Shut down the system and power off the chassis.
2. Remove the peripheral bay bezel.
3. If installed, remove the standard drive module, drive, or drive filler panel from the needed drive bay.

Note If removing a drive, first power it off by powering off or removing its CPU.

4. If necessary, install the mounting rails on the carrier frame.



5. For an *IDE* carrier frame, set the carrier frame's CPU assignment according to the following information.



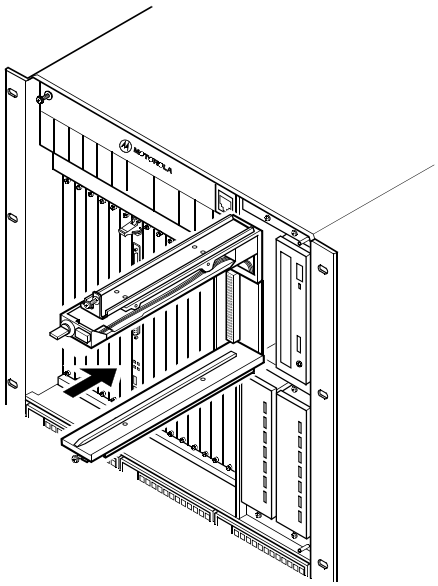
Drive Type	Configuration	Notes
IDE	CPU A - J1 pins 1 and 2 and J2 pins 1 and 2 CPU B - J1 pins 1 and 2 and J2 pins 1 and 2	

Drive Type	Configuration	Notes

Notes

1. Installing both jumpers allows both processors to notice a particular hard drive is present even though only one processor can read the data from the drive. This enables the A processor to acknowledge the drive in the B domain, and the B processor to acknowledge the drive in the A domain. This is done by routing a drive present bit to the HSC if the associated signal cable is also installed. If one jumper is not installed, the “A” processor won’t know if the hard drive in the B domain is in the system, and vice versa.
2. Unlike SCSI drives, the IDE drive can only be controlled by one host processor even if the other host processor acquires control of the domain.
3. The IDE device must be configured to match the processor board’s corresponding CPU slot, either CPU A or CPU B.
4. IDE peripheral devices are mapped to the same domain as the physical system processor they are connected to. A jumper on the carrier frame selects which HSC will see a PRESENT indication. When the other HSC takes control of the domain, the IDE peripheral does not map over. IDE devices are powered on and off with their host CPU.

6. Slide the carrier frame into the open peripheral bay and fasten with the captive screws provided (see the following figure). The keyswitch/LED should be at the top of the drive bay.



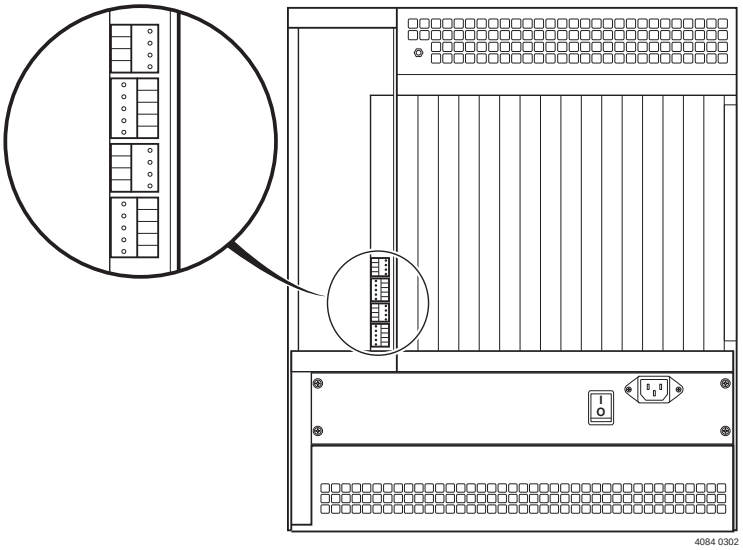
7. Replace the front peripheral bay bezel (the bezel is required for EMI shielding).
8. Cable the carrier frame according to the instructions in *Cabling the IDE Carrier Frame*.

Cabling the IDE Carrier Frame

This section describes the cabling of the IDE carrier frame to the system. Follow these steps to cable your carrier frame.

1. If necessary, remove the floppy housing from the rear of the chassis, refer to *Floppy Housing Removal and Installation* on page 98.
2. Connect a power cable to the backplane power connector (PWR1, PWR2, PWR3, or PWR4). Each connector provides two ground connections plus a +5V and a +12V output. The nominal wire gauge should be 18, however wire gauges of 16 to 28 can be used for a connection. All backplane power headers have the same pin-out and can be used interchangeably.

   If there is a previously installed power cable with a free connector, it may be used instead of installing a new one. No more than two drives should be powered by each connector.
3. Connect the other end of the power cable to the power connector on the back of the carrier frame. The connectors are keyed to prevent misconnection.
4. Connect the signal cable to the appropriate signal connector header on the backplane. See the following figure and table for locations and appropriate signal connector/drive bay use.



Connector	Configuration	Domain
PSIG1	Primary Master	A domain (upper drive)
PSIG2	Slave	A domain (upper drive)
PSIG3	Primary Master	B domain (lower drive)
PSIG4	Slave	B domain (lower drive)

5. Connect the other end of the signal cable to the carrier frame signal connector (JP11).
6. Connect the IDE drive cable to the backplane connector IDE A or IDE B, depending upon the domain setting of the drive being installed.

7. Connect the other end of the IDE drive cable to the hot swap carrier frame using these guidelines.
   - For IDE hot swap carrier frames, connect the other end of the IDE cable to the IDE connector JP2 on the back of the frame
   - If the IDE drive is configured as Master or Single and it is the only device on the cable, it should be located on the cable IDE connector farthest from the backplane connector
   - If the IDE drive is configured as Master or Slave, it should be located on the IDE connector closest to the backplane connector
   - If the IDE drives are configured as Cable Select, the drive on the cable connector located farthest from the backplane connector will be Master, and the one located closest to the backplane connector will be Slave
8. Reinstall the rear floppy housing.

Replacing a Hot Swap IDE Drive Module

Follow these steps to remove an IDE drive module (drive carrier and hard drive) from the chassis enclosure. This is in preparation for replacing a drive module.

Caution

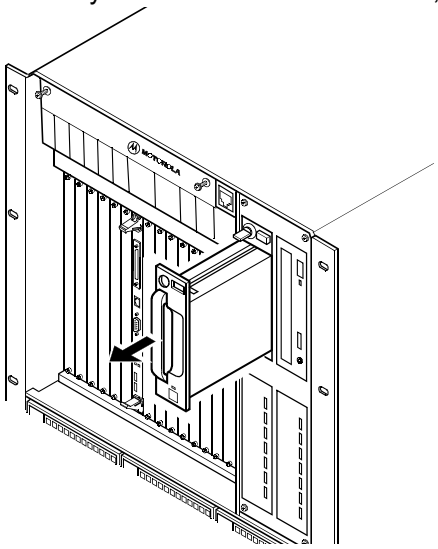
Prior to removing power from the drive, shutdown any running processes and the operating system. This will help prevent any data loss or damage to the operating system.

1. Push in the keyswitch and turn it counterclockwise 1/4 turn. This alerts the system that the drive is about to be removed and unlocks the drive module from the carrier frame.

Notes

1. Do not remove the drive module when the green LED is illuminated. When the drive module is ready to be removed, the green status LED goes out and the yellow status LED illuminates, indicating that the drive is off-line and ready to be removed.
2. The status LED activity is controlled by the system software. This procedure describes a typical configuration of the status LEDs. Your system may be configured differently, and the status LEDs may not function as indicated.

2. When the yellow status LED illuminates, pull the drive module straight out of the drive bay.



3. Pull off the top and bottom covers from the drive carrier.

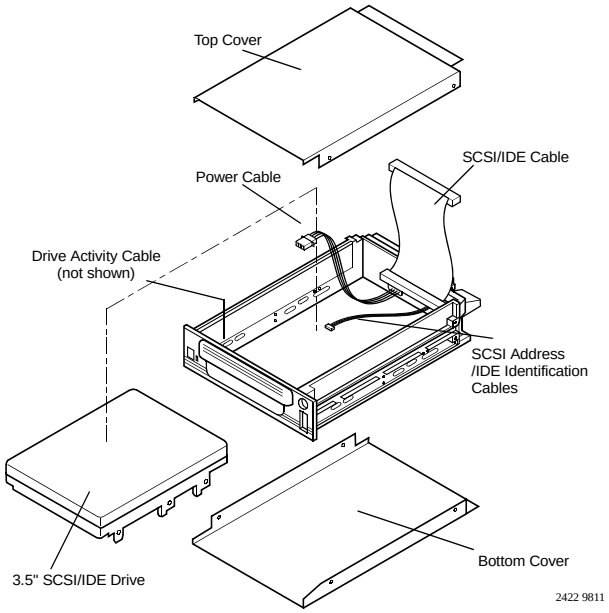
4. Remove the four mounting screws from the sides of the drive.

5. Push the drive up through the carrier and disconnect all signal and power cables from the drive.

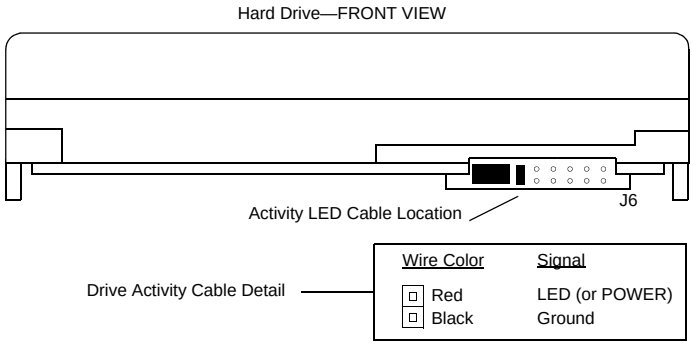
6. Configure the replacement drive.

   Each IDE drive can only be replaced with a drive of the same kind (IDE with IDE) and the replacement drive should be given the same IDE identification (master or slave) as the drive being replaced.

   To install the replacement drive into a drive carrier, refer to the sample figure below and perform the next steps.



7. Connect the drive activity cable, see the following illustration for cable location.



Note The location of the activity LED header varies depending upon the manufacturer of your drive. Refer to your drive vendor's documentation for the exact location. If a drive activity LED header is not provided, the cable can be connected to a spare +5V power header (the activity LED will remain lit) or be left disconnected (and remain unlit).

This header may not be available on IDE drives.

8. Connect the configuration wires.

   For IDE wiring, connect the wire connectors to the IDE drive's identification (Master, Slave, Single, Cable Select) jumper headers. Refer to your drive manufacturer's documentation for the location of these headers.

   There is a six-conductor cable that contains three wire pairs: red, yellow, and green. Check your drive to verify the wire color-coding, as it may differ between manufacturers.

   The wires extend the jumpers to a switch on the back of the drive carrier, so that by setting the switch number to ON, you are in effect setting that jumper. The next table provides the corresponding switch number for each wire. Note the location of each wire as it corresponds to your drive's settings. You need this information for setting the drive's identity.

Wire Color	Configuration	Switch Number
Red	Cable Select	4
Yellow	Slave	3
Green	Master	2

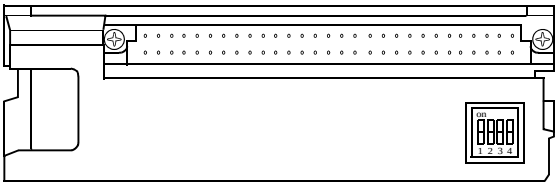
9. Align the drive's side mounting holes with the mounting holes in the drive carrier. Secure the drive with the four mounting screws.
10. Tuck all loose cables into the drive carrier.
11. Snap on the top carrier cover. The top cover is labeled "TOP" and has a flange along the back edge.
12. Snap on the bottom carrier cover. Note the position of the tapered corner. The bottom cover is labeled "BOTTOM" (the label is located on the back edge).

Installing the IDE Hot Swap Drive Module

Before performing this procedure, you must have installed the carrier frame in the drive bay and installed the drive into the hot swap drive carrier.

1. Make sure you have configured the drive identification on the back of the drive carrier. Refer to page 72 for steps on setting the drive identification.

   The IDE drive identification (Master, Slave, Single, Cable Select) for drives mounted in a hot swap drive module is passed from the drive's jumper location to a four-pole switch on the rear of the carrier (see the switch location shown on the figure below).



   The recommended configuration is to set the drive to Master if it is the first or the only IDE drive to be installed on the domain, and to Slave if it is the second. Refer to page 72 for wiring instructions.

Note Do not insert the drive module if the green LED is illuminated.

2. Align the drive module connector with the hot swap carrier frame connectors, then slide the replacement drive module into the slot and seat firmly.

3. Push in the drive's keyswitch and turn it clockwise 1/4 turn.

   This latches the drive module into the frame to prevent accidental removal, and alerts the system to the drive's availability (if configured with the appropriate hot swap-aware software).

   The yellow status LED goes out and the green status LED illuminates, indicating that the drive is online and available, as controlled by the software.

Note The status LED activity is controlled by the system software. This procedure describes a typical configuration of the status LEDs. Your system may be configured differently, and the status LEDs may not function as indicated.

Hot Swap SCSI Drives

This section provides information specifically for the SCSI drive. It details the procedures for: installing and cabling a SCSI carrier frame, setting domains and addresses, installing a drive into a SCSI drive carrier, and finally installing the drive module into the drive bay.

Installing a SCSI Carrier Frame and Assigning Domains

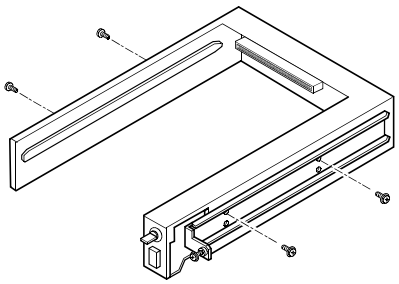
SCSI hot swap drive carriers are identified by a gold keyswitch on the front of the carrier and a SCSI connector on the rear of the carrier.

To configure and install the SCSI carrier frame in your system, follow these steps.

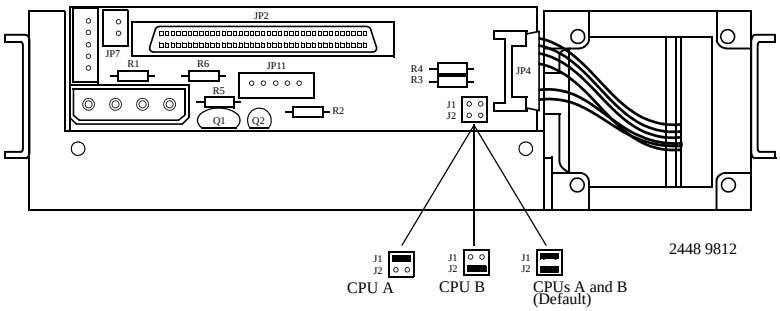
1. Shut down the system and power off the chassis.
2. Remove the peripheral bay bezel.
3. If installed, remove the standard drive carrier, drive, or drive filler panel from the needed drive bay.

Note If removing a drive, first power it off by powering off or removing its CPU.

4. If necessary, install the mounting rails on the carrier frame.



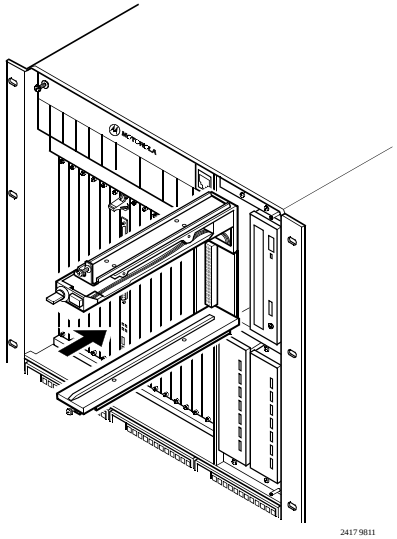
5. For a SCSI carrier frame, set the carrier frame's CPU assignment according to the following information.



Drive Type	Configuration	
SCSI	Set CPUs using J1 and J2 on the back of the carrier frame. CPU A - J1 pins 1 and 2 CPU B - J2 pins 1 and 2 CPUs A and B (default) - J1 pins 1- 2 and J2 pins 1 - 2.	**Notes** 1. The SCSI controller resides on a domain's host processor board. Configure only for that domain (CPU A or CPU B) 2. The device is configured to boot domain A or B 3. Only that domain's processor can control the SCSI device even if the host processor for the other domain acquires control of the domain. 4. The SCSI controller must reside on that domain's processor and should be configured to belong to that domain only.
SCSI	The SCSI controller resides in a nonhost system slot and is not configured to boot the domain.	**Notes** 1. Configure so that either processor board can gain access to that device via the HSC. 2. Example: Domain B's host processor acquires control of Domain A and the SCSI controller for Domain A is in one of the nonhost system slots, the drives attached to that SCSI controller are available to Domain B's host processor. 3. Use the default configuration (both A and B).
Note SCSI peripheral devices may be mapped to both domains by setting the jumpers accordingly. This ensures the SCSI device remains active when a system processor/bridge pair is removed or powered down. If the SCSI device is only used by one of the system processors, it should be set like an IDE device.		

When the switch is engaged, the hot swap carrier sends a PRESENT signal to the HSC module. This setting (A/B) makes the device available to the specific domain's processor board and allows the domain's host processor and HSC module to control the device's status indicators and power.

6. Slide the carrier frame into the open peripheral bay and fasten with the captive screws provided (see the following figure). The keyswitch/LED should be at the top of the drive bay.



7. Replace the front peripheral bay bezel (the bezel is required for EMI shielding).

8. Cable the carrier frame according to the instructions in *Cabling the SCSI Carrier Frame*.

Cabling the SCSI Carrier Frame

This section describes the cabling of the SCSI carrier frame to the system. Follow these steps to cable your carrier frame.

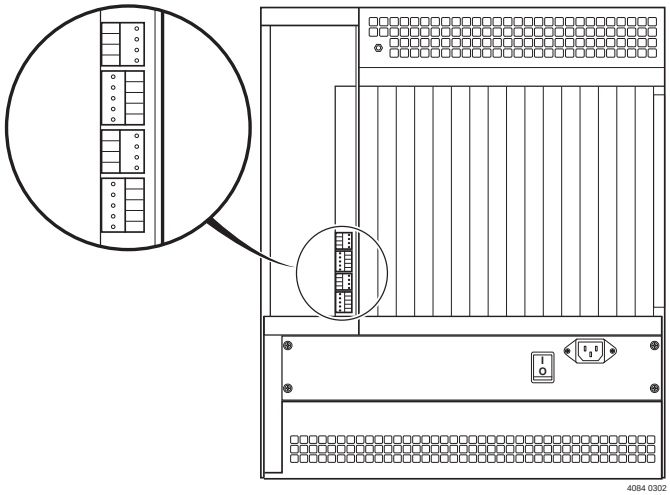
1. If necessary, remove the floppy housing from the rear of the chassis, refer to *Floppy Housing Removal and Installation* on page 98.

2. If not already installed, connect a power cable to the backplane power connector (PWR1, PWR2, PWR3, or PWR4). Each connector provides two ground connections plus a +5V and a +12V output. The nominal wire gauge should be 18, however wire gauges of 16 to 28 can be used for a connection. All backplane power headers have the same pin-out and can be used interchangeably.

Note If there is a previously installed power cable with a free connector, that may be used instead of installing a new one. It is recommended that no more than two drives be powered by each connector.

3. Connect the other end of the power cable to the power connector on the back of the carrier frame. The connectors are keyed to prevent misconnection.

4. Connect the signal cable to the appropriate signal connector header on the backplane (PSIG1, PSIG2, PSIG3, PSIG4). Refer to the following figure and table for the header locations and appropriate signal connector/drive bay use.



Connector	Configuration	Domain
PSIG1	0 Drive	A domain
PSIG2	1 Drive	A domain
PSIG3	0 Drive	B domain
PSIG4	1 Drive	B domain

5. Connect the other end of the signal cable to the carrier frame signal connector, JP11.
6. Connect the SCSI drive cable to the system.

   For SCSI hot swap carrier frames, connect the rigid metal connector end of the two- or four-drive SCSI drive cable to an external SCSI port on the floppy housing.

   The external SCSI cable will run from this connector, through the CPX8216 cable pass-through, to the selected SCSI controller.
7. Connect one of the cable's free SCSI connectors to the SCSI connector on the back of the hot swap carrier frame. Make sure the SCSI cable is properly terminated.
8. Reinstall the rear floppy housing.

Replacing a Hot Swap SCSI Drive Module

Follow these steps to remove a SCSI drive module from the chassis enclosure. This is in preparation for replacing a drive module.

Caution

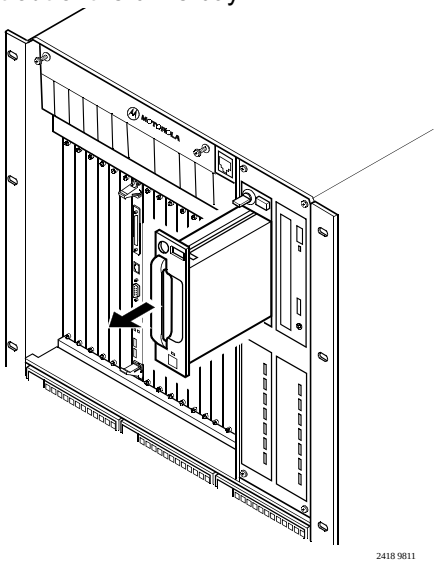
Prior to removing power from the SCSI drive, shutdown any running processes and the operating system. This will help prevent any data loss or damage to the operating system.

1. Push in the keyswitch and turn it counterclockwise 1/4 turn. This alerts the system that the drive is about to be removed and unlocks the drive module from the carrier frame.

Note Do not remove the drive module when the green LED is illuminated. When the drive module is ready to be removed, the green status LED goes out and the yellow status LED illuminates, indicating that the drive is off-line and ready to be removed.

The status LED activity is controlled by the system software. This procedure describes a typical configuration of the status LEDs. Your system may be configured differently, and the status LEDs may not function as indicated.

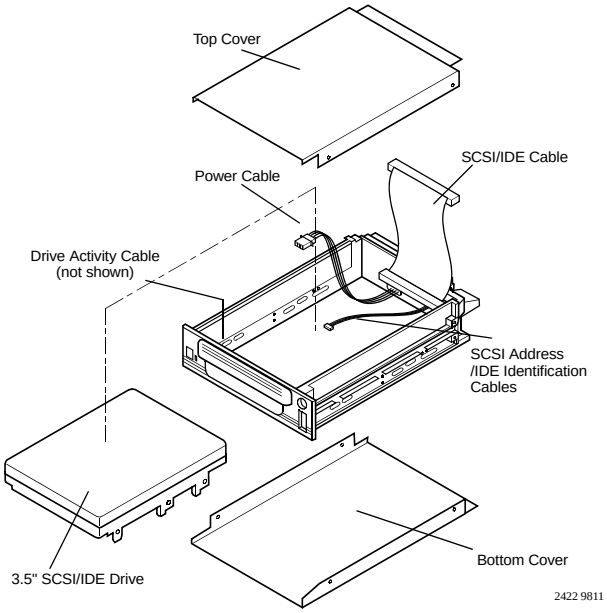
2. When the yellow status LED is illuminated and the drive ceases to spin, pull the drive module straight out of the drive bay.



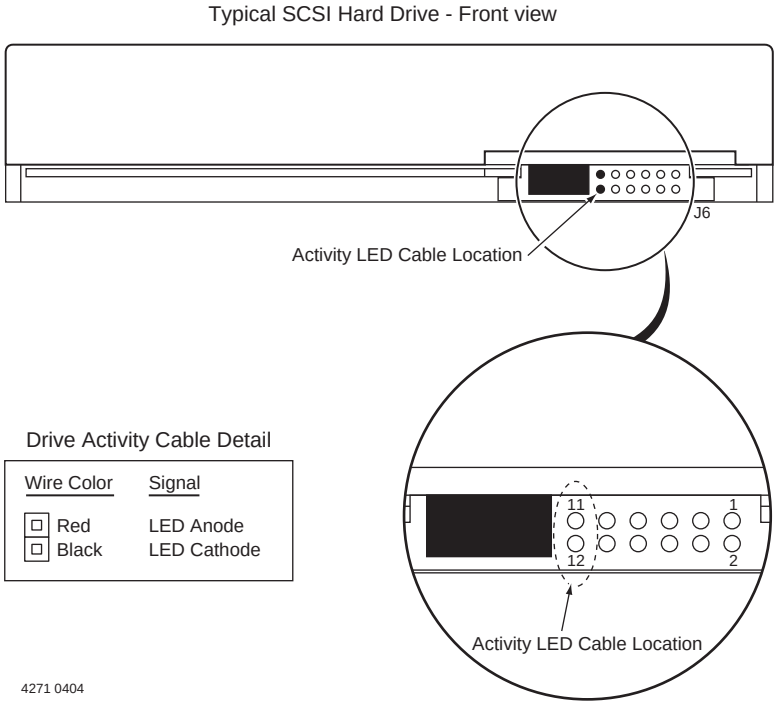
3. Pull off the top and bottom covers from the drive carrier.
4. Remove the four mounting screws from the sides of the drives.
5. Push the drive up through the carrier and disconnect all signal and power cables from the drive.
6. Configure the replacement drive.

Each drive can only be replaced with a drive of the same kind (SCSI with SCSI) and the replacement drive should be given the same address as the drive being replaced.

To install the replacement drive into a hot swap carrier, refer to the sample figure below and perform the next steps.



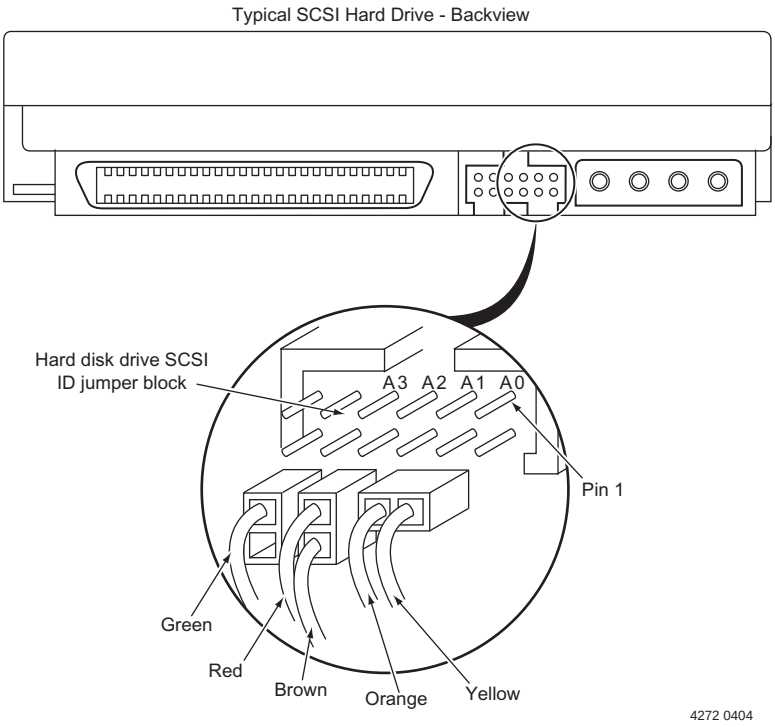
7. Connect the drive activity cable, see the following illustration for cable location.



Note The location of the activity LED header varies depending upon the manufacturer of your drive. Refer to your drive vendor's documentation for the exact location. If a drive activity LED header is not provided, the cable can be connected to a spare +5V power header (the activity LED will remain lit) or be left disconnected (and remain unlit).

8. Refer to the next table and figure and connect the SCSI address wires.

Note The location of the address header may vary depending upon the manufacturer of your drive. Refer to your drive vendor's documentation for the exact location.



Wire Color	SCSI ID
GRN	SCSI ID A3
RED	SCSI ID A2
BRN	GROUND
ORN	SCSI ID A1
YLW	SCSI ID A0

9. Attach the power cable to the drive's DC power connector. The connector is keyed for proper orientation.

10. Attach the drive signal cable to the drive's connector and to the hot swap drive carrier's connector (JP2). Be sure to align pin 1 on the cable with pin 1 on the drive.

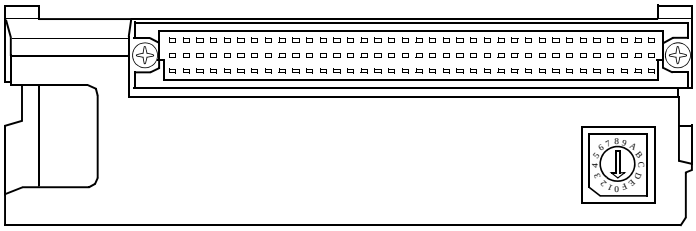
11. Align the drive's side mounting holes with the mounting holes in the carrier. Secure the drive with the four mounting screws.
12. Tuck all loose cables into the drive carrier.
13. Snap on the top carrier cover. The top cover is labeled "TOP" and has a flange along the back edge.
14. Snap on the bottom carrier cover. Note the position of the tapered corner. The bottom cover is labeled "BOTTOM" (the label is located on the back edge).

Installing the SCSI Hot Swap Drive Module

Before performing this procedure, you must have installed the carrier frame in the drive bay and installed the drive into the drive carrier.

1. Verify that the SCSI address has been configured and that each SCSI device attached to the controller has a unique address.

   For SCSI devices mounted in a hot swap drive module, the SCSI device address settings are passed via cable from the SCSI device's address jumpers to a rotary switch on the back of the hot swap drive carrier (see next figure). The following table provides the corresponding SCSI device addresses for the rotary switch positions.



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Rotary Switch Position	SCSI Device Address	Rotary Switch Position	SCSI Device Address
0	0	8	80
1	10	9	90
2	20	A	A0
3	30	B	B0
4	40	C	C0
5	50	D	D0
6	60	E	E0
7	70	F	F0

2. Make sure the keyswitch on the carrier frame is open (1/4 turn counterclockwise).

Note Do not attempt to install the drive module if the green LED is illuminated.

3. Align the drive module connector and the carrier frame connector, then slide the replacement drive module into the slot and seat firmly.

4. Push in the drive's keyswitch and turn it clockwise 1/4 turn.

   This latches the drive module into the frame to prevent accidental removal, and alerts the system to the drive's availability (if configured with the appropriate hot swap software).

   The yellow status LED goes out and the green status LED illuminates, indicating that the drive is online and available as controlled by software.

Note The status LED activity is controlled by the system software. This procedure describes a typical configuration of the status LEDs. Your system may be configured differently, and the status LEDs may not function as indicated.

Non-Hot Swap Drive Modules

These procedures for working with non-hot swap drive modules are covered in the next several sections. Please read this information before attempting to replace your drives.

- *Replacing a Non-Hot Swap 3.5-inch Drive*
- *Drive Configuration*
- *Replacing a Non-Hot Swap 5.25-inch Drive*
- *Cabling the SCSI or IDE Non-Hot Swap Drive*
- *Replacing a Floppy Drive*

Replacing a Non-Hot Swap 3.5-inch Drive

These instructions describe the removal and installation of a 3.5-inch hard drive. This installation requires the use of a standard (non-hot swap) drive carrier. It applies to both SCSI and IDE drives.

Caution

You need to shut down the operating system and remove the input power before performing these procedures.

Refer to the next figure and follow these steps to remove a 3.5-inch hard drive and drive carrier (drive module) from the drive bay.

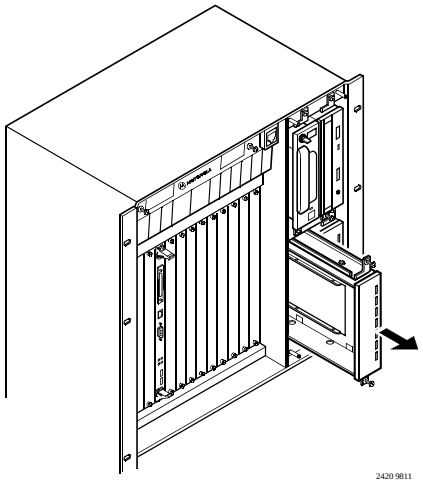
1. Shut down the system and power off the chassis.

2. If necessary, remove the floppy housing from the rear of the chassis, refer to *Floppy Housing Removal and Installation* on page 98

3. Detach the signal and power cables from the rear of the drive being removed.

   If not replacing the drive with another drive at this time, replace the floppy housing, otherwise leave it off for access to the cables during drive installation.

4. Remove the two retaining screws from the top and bottom of the drive carrier.
5. Pull the drive carrier straight out of the peripheral bay.



At this point you can:

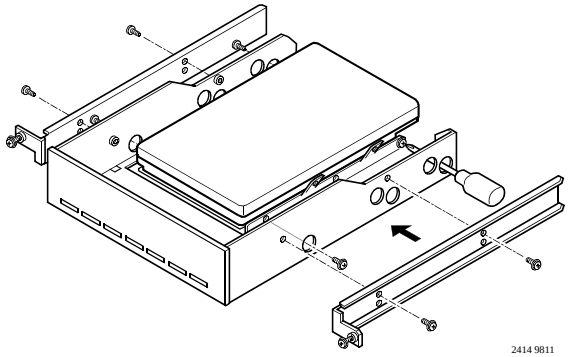
- Replace the drive module with another driver module
- Remove the drive from the drive carrier and replace it with another drive (see *Removing the Drive from the Standard Carrier* and *Installing the Drive In the Standard Carrier*
- Replace the drive module with an empty carrier (needed for EMI shielding)

Removing the Drive from the Standard Carrier

These steps should be performed with the drive module resting on a flat, static-free surface with the component side down to prevent damage to the drive.

Refer to the next figure while following these instructions.

1. Remove the screws from the guide rails. Remove the guide rails from the sides of the carrier.



2. Remove the four screws fastening the drive to the carrier.

If you are not going to fill the empty drive bay with another drive, reinstall the guide rails and replace the empty drive carrier back in the slot.

3. Replace the drive bay bezel.

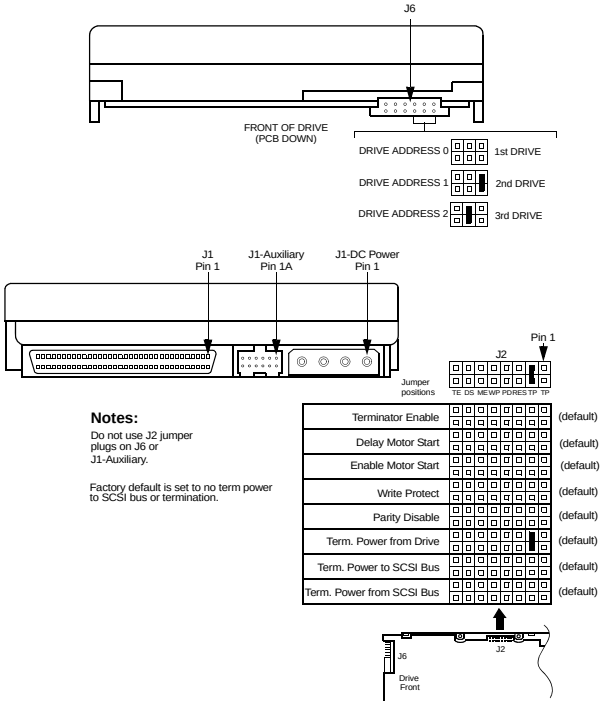
If you are going to install another drive in the empty drive bay, proceed to *Installing the Drive In the Standard Carrier*.

Drive Configuration

This section describes the configuration of a 3.5-inch SCSI or IDE hard drive.

Configuring Non-Hot Swap SCSI Drives

Each SCSI drive must be configured with a unique SCSI address. The next figure provides the configuration information for SCSI drives installed in a non-hot swap drive carrier.



The header locations may vary depending on the manufacturer of the drive. Refer to your drive manufacturer's documentation for the exact location and configuration of the drive's headers.

After configuring the SCSI drive, go to *Installing the Drive In the Standard Carrier* on page 85.

Configuring Non-Hot Swap IDE Drives

Each IDE drive must have its identification (Single, Master, Slave, or Cable Select) set before installation. The recommended configuration is to set the drive to Master if is the first or the only IDE drive to be installed on the domain, and to Slave if it is the second.

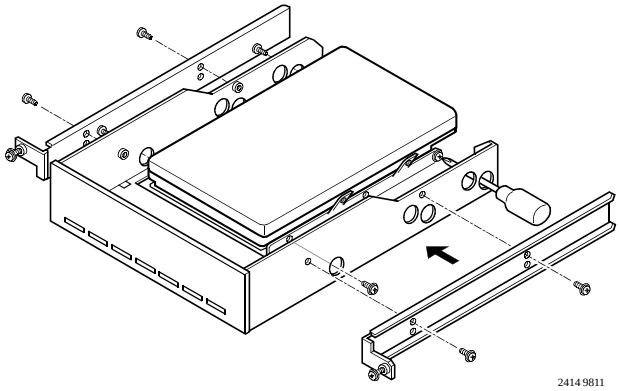
Refer to your drive manufacturer's documentation for information about setting the drive's identification.

When you have finished configuring the IDE drives, continue with the next procedures.

Installing the Drive In the Standard Carrier

After you configure the drive, follow these steps to install it in the drive carrier. Refer to the next figure.

1. If the drive carrier has guide rails installed, remove them.

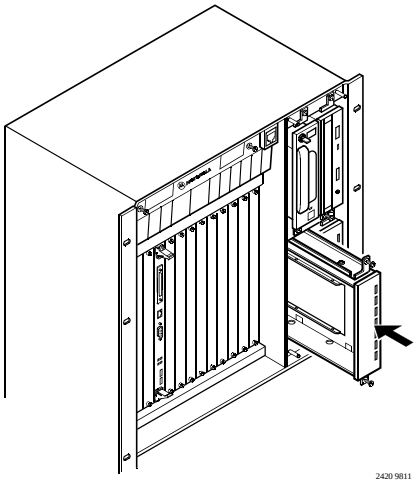


2. Lay the drive carrier open-side up on a flat, static-free surface.
3. Position the drive in the carrier component-side down so that the mounting holes in the drive and the carrier line up.
4. Secure the drive to the carrier with the mounting screws provided by the drive manufacturer.
5. Attach the guide rails to the sides of the carrier.

Installing the Drive Module into the Drive Bay

After installing the drive into the carrier, follow these steps to install the drive module into the drive bay.

1. If not already removed, remove the drive bay bezel on the front of the chassis.
2. Insert the drive module into the empty drive slot. The open end of the carrier (the top) should face the left (towards the CompactPCI card cage). Refer to the next figure showing the drive module installation.



3. Fasten the drive module to the chassis using the captive screws on the upper and lower mounting rails.
4. Replace the drive bay bezel. The drive bay bezel is required for EMI shielding.
5. Cable the drive in the rear of the chassis according to the appropriate instructions in the section, *Cabling the SCSI or IDE Non-Hot Swap Drive*.

Replacing a Non-Hot Swap 5.25-inch Drive

This section describes the removal and installation of a 5.25-inch drive from the front peripheral bay. It applies to both SCSI and IDE drives. The 5.25-inch drive requires drive guide rails instead of a drive carrier for installation.

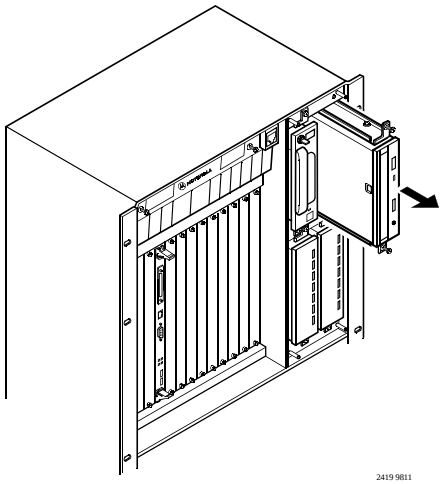
You must shut down the operating system and remove the input power before performing these procedures.

Removing a 5.25-inch Drive

Follow these procedures to remove a 5.25-inch drive from the chassis.

1. Shut down the system and power off the chassis. Remove the power input lines from the rear of the chassis.
2. If necessary, remove the floppy housing from the rear of the chassis, refer to *Floppy Housing Removal and Installation* on page 98.
3. Detach the power and drive cables from the rear of the drive being removed.

   If not replacing the drive with another drive at this time, replace the floppy housing, otherwise leave it off for access to the cables during drive installation.
4. Remove the drive bay bezel from the front of the chassis.
5. Loosen the captive screws fastening the drive to the peripheral bay.
6. Pull the drive straight out of the bay, as shown.



7. Remove the mounting rails from the sides of the drive.

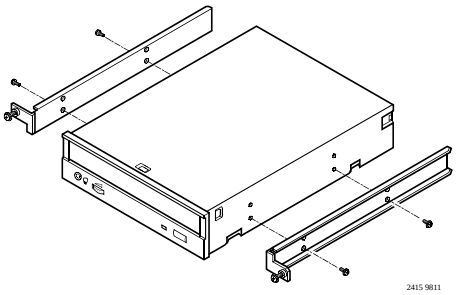
Installing the 5.25-inch Drive

This section describes the installation and configuration of 5.25-inch drives, such as CD-ROM drives, in the front peripheral bay.

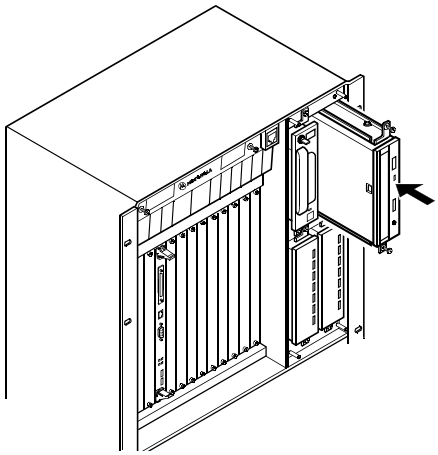
Caution

Shut down the operating system and remove the input power before performing these procedures.

1. Configure the drive according to your drive manufacturer's instructions. Each SCSI drive must have a unique SCSI address.
2. Attach the mounting rails to the sides of the drive, using the screws as specified by the manufacturer, as shown.



3. Insert the drive into the empty slot in the peripheral bay and secure with the captive screws provided. The top of the drive should face left (towards the CompactPCI card cage).



4. Replace the drive bay bezel and secure it with the captive screws provided.

   The drive bay bezel is necessary for complete EMI shielding.

Cabling the SCSI or IDE Non-Hot Swap Drive

Follow these steps to connect the cables to either a SCSI or IDE drive. For reference, you may refer to the sections *Cabling the SCSI Carrier Frame* on page 76 or *Cabling the IDE Carrier Frame* on page 69.

1. If necessary, remove the floppy housing from the rear of the chassis, refer to *Floppy Housing Removal and Installation* on page 98.
2. If not already installed, connect a power cable to the backplane power connector (PWR1, PWR2, PWR3, or PWR4). All backplane power headers have the same pinout and can be used interchangeably.

   If there is a previously installed power cable with a free connector, that may be used instead of installing a new one.
3. Connect the other end of the power cable to the power connector on the back of the drive. The connectors are keyed to prevent misconnection.
4. Connect the appropriate drive cable to the system:
   - For IDE drives, connect the IDE cable to the backplane connector IDE A or IDE B, depending upon the domain controlling the drive
   - For SCSI drives, connect the rigid metal connector end of the two- or four-drive SCSI cable to an external SCSI port on the floppy housing

     The external SCSI cable will run from this connector, through the CPX8216 cable pass-through, to the selected SCSI controller.
5. Connect the other end of the drive cable to the drive. Be sure to align pin 1 of the cable with pin 1 on the drive connector.

Note If connecting a SCSI drive, make sure the SCSI cable is properly terminated.

6. Reinstall the rear floppy housing.

Replacing a Floppy Drive

This section gives information on how to remove and install a floppy drive in your chassis.

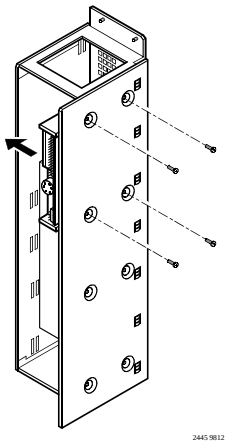
Removal

Follow these steps to remove a floppy drive from the floppy housing in the rear of the chassis.

Caution

The drives mounted in this bay are not hot-swappable. Shut down the system and remove the input power before performing these procedures.

1. Remove the floppy housing from the rear of the chassis. Refer to *Floppy Housing Removal and Installation* on page 98.
2. Remove the power and signal cables from the drive to be removed.
3. Loosen the captive screws holding the floppy drive to the floppy drive housing and pull the drive free, as shown below.



4. If not installing another drive at this time, fasten a blank filler panel over the floppy drive opening in the floppy housing.

   The filler panel must be installed to complete EMI shielding.

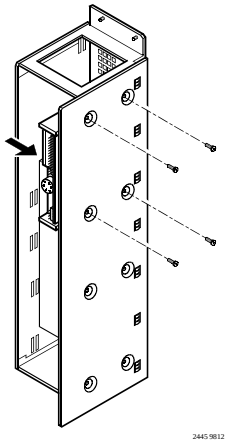
5. Reinstall the floppy housing (slide the housing straight into the chassis and secure the housing to the chassis with the four captive screws provided).

Installation

The floppy drives are NOT hot swappable. You must shut down the system and remove the input power before performing these procedures.

The floppy housing can have either one, two, or no spaces for mounting a floppy drive. Make sure you have an available floppy drive slot before performing this procedure.

1. Remove the floppy housing from the rear of the system. Refer to *Floppy Housing Removal and Installation* on page 98.
2. If present, remove the blank filler panel from the floppy drive opening in the floppy housing.
3. Insert the floppy drive into the floppy housing. The circuit side of the drive should face the side of the housing containing the mounting holes, as shown.



4. Fasten the floppy drive to the floppy housing with the mounting screws specified by the manufacturer.
5. Fasten the keyed end of the floppy drive cable (the end without the twist in the cable) to either the FDA or the FDB connector on the backplane, depending upon which domain will be accessing the drive. For the connector location, refer to Figure 3-5 on page 20.
6. Connect the other end of the floppy drive cable to the connector on the rear of the floppy drive. This end is not keyed. Be sure to align pin 1 of the cable with pin 1 on the drive.
7. If not already installed, connect a power cable to the backplane power connector (PWR1, PWR2, PWR3, or PWR4). All backplane power headers have the same pin-out and can be used interchangeably.

   If there is a previously installed power cable with a free connector, that may be used instead of installing a new one.
8. Connect a free end of the power cable to the power connector on the back of the drive. The connectors are keyed to prevent misconnection.
9. Reinstall the floppy housing.

Subassembly Removal and Installation

9

Overview

This chapter provides the removal and installation procedures for field-replaceable subassemblies. Note that the CPX8216 backplane is not a field-replaceable unit.

These procedures should be performed by trained service personnel only. The list below shows the subassembly removal/installation procedures included in this chapter.

- *Fan and Power Supply Sled Removal and Installation*
- *Alarm Panel Removal and Installation (Hot Swap)*
- *AC or DC Power Distribution Panel*
- *Floppy Housing Removal and Installation*

Fan and Power Supply Sled Removal and Installation

The CPX8216 chassis supports N+1 redundant power supplies. If the chassis is equipped with a redundant power supply, the removal of a single power supply does not interrupt system operation.

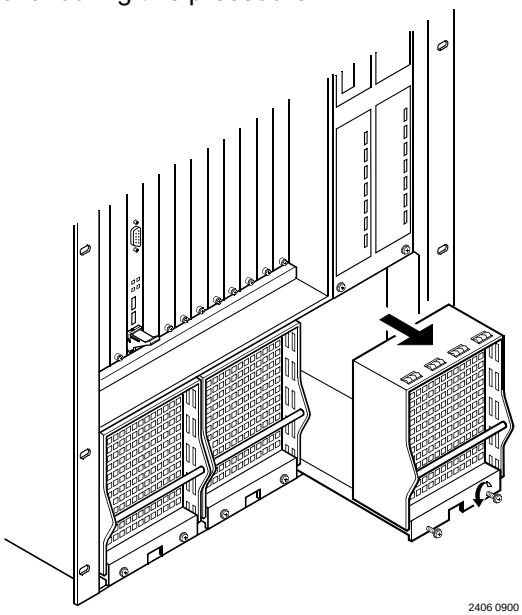
The following instructions describe how to remove and install a fan/power supply sled. The instructions apply to both the AC and the DC versions of the power supply. There are also procedures for the replacement of the fan module which is housed in the fan/power supply sled.

Removal

To remove a fan/power supply sled, refer to the next figure and follow these steps.

1. If the chassis is NOT equipped with a redundant power supply, and you are removing one of them, shut the chassis down.

   If the chassis IS equipped with a redundant power supply, or if the chassis is NOT equipped with a redundant power supply but you are removing the fan-only sled, the chassis can remain operational during this procedure.



2. Loosen the two captive screws located at the bottom of the fan/power supply sled to be removed.

Warning

Do not touch any of the exposed leads or terminals. Hazardous voltages, capable of causing death, may be present in this product.

3. Using the handle on the front of the fan/power supply sled, pull the power supply slowly straight out of the chassis. Support the sled from the bottom and lift the back edge of it over the front lip of the chassis.

Caution

DO NOT operate the chassis for more than one minute with a fan/power supply sled removed.

Installation

Follow these steps to install a new power supply and fan assembly into the chassis.

1. The fan/power supply sled should be inserted with a single, steady motion. Slowly slide the fan/power supply sled into the chassis. Guides on the chassis and rails on the sled assist in properly aligning the sled during insertion.

Caution

Bouncing the sled during insertion may cause an alarm condition in the system. Also, the sled should not be forced into the slot.

2. If the assembly hangs during insertion, back the sled out and reinsert.
3. Tighten the two captive screws located on the bottom front of the fan/power supply sled.

Fan Module Replacement

The fan module in both the power supply sled and fan-only sled is replaceable. The chassis may remain operational during this procedure, you do not need to remove the power supply/fan sled. To replace a fan, follow these steps.

1. Loosen the captive screws located at each corner of the fan/power supply sled to be removed.

Warning

Do not touch any of the exposed leads or terminals. Hazardous voltages, capable of causing death, may be present in this product.

3. Using the handle on the front of the fan/power supply sled, slowly pull the fan module straight out of the sled. Be careful to lift the back edge of the module over the front lip of the chassis.

Caution

DO NOT operate the chassis for more than one minute with a fan module removed.

4. Install the replacement fan module by aligning the unit with the opening in the fan/power supply sled. The handle should be at the bottom of the module. Slowly insert the module until the EMI gaskets on the top and sides of the module have cleared. Make sure the 10-pin connector has fully seated.
5. Secure the fan module by tightening the four captive screws.

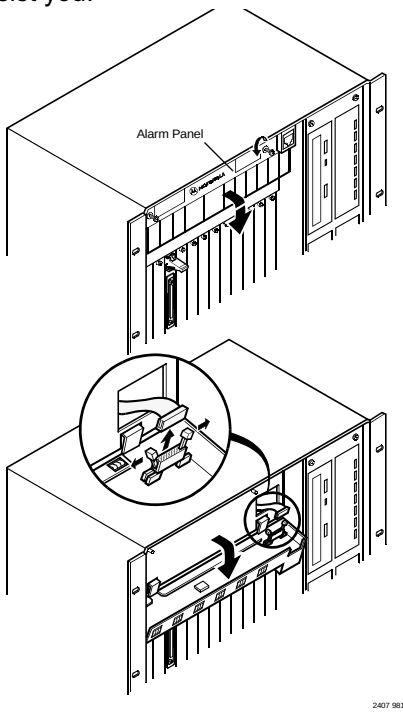
Alarm Panel Removal and Installation (Hot Swap)

The alarm panel is hot swappable—it can be removed from a live chassis without affecting system functions or performance, or the function of the alarm panel itself.

Removal

Refer to the next figure and follow these steps to remove the alarm panel from the chassis:

1. Loosen the two captive screws at the top of the alarm panel.
2. Pull the top of the alarm panel away from the chassis. You may need to pull the two captive screws to assist you.



3. Guide the two tabs at the bottom of the alarm panel out of their slots in the chassis.
4. Remove the alarm cable by pushing the two retaining clips out. This forces the connector off of the header.

Note The critical alarm is a normally closed relay. If the alarm panel is connected to remote alarm monitoring equipment, removing the system alarm cable may result in a critical alarm report.

Installation

Refer to the preceding figure and follow these instructions:

1. Push the connector on the alarm cable into header J4 on the alarm panel. The cable connector and header are keyed—they will only fit together in the proper direction. The retaining clips automatically close as the connector is seated.
2. Gently squeeze the retaining clips towards each other to ensure that they are fully closed and the connector is fully seated.
3. Guide the tabs at the bottom of the alarm panel into their slots in the chassis.
4. Push the top of the alarm panel towards the top of the chassis and secure the alarm board with the two captive screws provided.

AC or DC Power Distribution Panel

Warning

This subassembly is not a field-replaceable unit. Regulatory guidelines do not allow the replacement or repair of CPX power distribution panels by the customer. Replacement and repair must be managed by the Emerson Field Service Organization (FSO) so the warranty and regulatory labels are not voided. Please contact your Emerson sales representative.

The power distribution panel is not hot swappable in CPX8216 platforms. Removing the power distribution panel disconnects all of the power supplies from the input power. For supporting information on the power distribution panel, refer to Chapter 6, *Chassis Operations*.

Warning

To prevent serious injury or death from dangerous voltages, before removing the power supply, set the power switch to OFF (O), disconnect all power cords from their sources, and allow one minute for the capacitors in the power supply to discharge.

Warning

Disconnect power supply before servicing.

Service personnel: If using more than one DC power circuit, disconnect all power sources before installing or servicing any components internal to the CPX enclosure.

For important grounding information for a DC power source, please read the instructions in *Connecting the Chassis Cables* on page 40.

Note The DC power inputs must only be attached to approved Telephone Network Voltage (TNV) or SELV (Safe Extra Low Voltage) branch circuits. Branch circuits must comply with all requirements called for in these safety standards: IEC 60950, EN 60950, CAN/CSA-C22.2 No. 60950-00. Attaching inputs to non-TNV/SELV approved power sources will cause the system to fail compliance with safety regulations.

Floppy Housing Removal and Installation

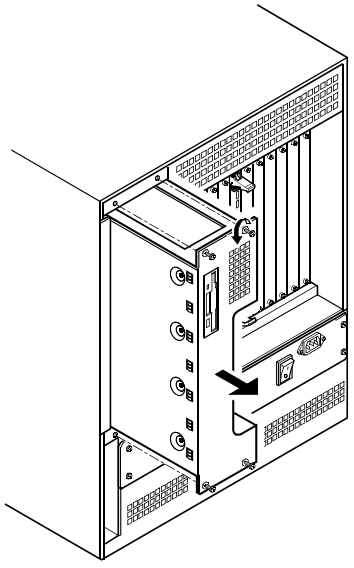
The floppy housing is located in the rear of the chassis. It can accommodate up to two floppy drives and two SCSI connectors.

The floppy housing is not hot swappable.

Removal

Refer to the next figure and follow these steps to remove the floppy housing from the chassis.

1. Shut down the operating system. If the system is configured as a dual-8 system, make sure that both domains are shut down.
2. Disconnect the external SCSI cable(s) from the back of the floppy housing. If more than one SCSI cable is installed, mark the cable and associated housing connector for later reinstallation.
3. Turn the chassis power off.
4. Loosen the four captive screws in the corners of the floppy housing.
5. Pull the housing straight out of the chassis.



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Installing the Floppy Housing

Refer to the preceding figure and follow these steps to install the floppy housing in your chassis.

Make sure the internal floppy and SCSI drives are cabled before installing the floppy housing. Refer to Chapter 8, *Drive Removal and Installation* for drive cabling information.

1. Slide the housing straight into the chassis and secure with the four captive screws in the corners of the housing.
2. Attach the external SCSI cables to the SCSI connectors on the face of the housing.

   It is important to replace these cables exactly as before—with domain A attached to the domain A drives, and domain B to the domain B drives. Refer to Chapter 8, *Drive Removal and Installation* for drive cabling information.

Pin Assignments

10

Overview

This chapter provides pin assignments and reference information for the backplane connectors of the CPX8216 and CPX8216T chassis and other major connectors associated with the chassis and transition modules.

Following is a list of the backplane and other chassis connectors covered in this chapter:

- *Backplane Connectors*
- *Transition Module Slots*
- *Power Supply Connectors (PS1, PS2, PS3)*
- *H.110 Power Connector (CPX8216T Only)*
- *Peripheral Power Connectors (PWR1, PWR2, PWR3, PWR4)*
- *Peripheral Signal Connectors (SIG1, SIG2, SIG3, SIG4)*
- *Alarm Display Panel Interface Connector (J4)*
- *Alarm Interface Connector (ALARM)*
- *Remote Alarm Connector (J1)*
- *Drive Connectors*

Backplane Connectors

This section provides the pin assignments for the CompactPCI connectors P1 through P5 for the CPX8216 standard backplane.

Primary (Front) Side I/O Connectors (Slots 1-6 and 11-16)

In the front I/O slots (chassis slots 1-6 and 11-16), connectors P3, P4, and P5 are reserved for user I/O.

Connectors P1 and P2 carry the CompactPCI bus (bus A for slots 1-6, bus B for slots 11-16).

Table 10-1. P5 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22-1	GND	I/O	I/O	I/O	I/O	I/O	GND
All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.							

Table 10-2. P4 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25-15	GND	I/O	I/O	I/O	I/O	I/O	GND
14	**KEY AREA**						
13							
12							
11-1	GND	I/O	I/O	I/O	I/O	I/O	GND

All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.

Table 10-3. P3 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19-1	GND	I/O	I/O	I/O	I/O	I/O	GND

All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.

Table 10-4. P2 Connector, I/O Slots 1-6 and 11-16 (CPCI Bus)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND		GND	RSV	RSV	RSV	GND
20	GND		GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND
17	GND	_BRSVP2A17	GND				GND
16	GND	_BRSVP2A16	_BRSVP2B16			_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND				GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND

Signals beginning with an underscore (_) are prefixed with the bus name:

*For boards located in slots 1-6 (Domain A), the signal name is prefixed with PCI_A (for example, PCI_A_AD[49]).

*For boards located in slots 11-16 (Domain B), the signal name is prefixed with PCI_B (for example, PCI_B_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Table 10-4. P2 Connector, I/O Slots 1-6 and 11-16 (CPCI Bus) (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND		GND				GND
2	GND						GND
1	GND		GND				GND

Signals beginning with an underscore (_) are prefixed with the bus name:

*For boards located in slots 1-6 (Domain A), the signal name is prefixed with PCI_A (for example, PCI_A_AD[49]).

*For boards located in slots 11-16 (Domain B), the signal name is prefixed with PCI_B (for example, PCI_B_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Table 10-5. P1 Connector, I/O Slots 1-6 and 11-16 (CPCI Bus)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	5V	_REQ64#	A_ENUM#	3.3V	5V	GND
24	GND	_AD[1]	5V	VIO	_AD[0]	_ACK64#	GND
23	GND	3.3V	_AD[4]	_AD[3]	5V	_AD[2]	GND
22	GND	_AD[7]	GND	3.3V	_AD[6]	_AD[5]	GND
21	GND	3.3V	_AD[9]	_AD[8]	_M66EN	_C/BE[0]#	GND
20	GND	_AD[12]	GND	VIO	_AD[11]	_AD[10]	GND

Signals beginning with an underscore (_) are prefixed with the bus name:

*For boards located in slots 1-6 (Domain A), the signal name is prefixed with PCI_A (for example, PCI_A_AD[49]).

*For boards located in slots 11-16 (Domain B), the signal name is prefixed with PCI_B (for example, PCI_B_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Signal A_ENUM# in Domain A (slots 1-6), B_ENUM# in Domain B (Slots 11-16).

Table 10-5. P1 Connector, I/O Slots 1-6 and 11-16 (CPCI Bus) (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	3.3V	_AD[15]	_AD[14]	GND	_AD[13]	GND
18	GND	_SERR#	GND	3.3V	_PAR	_C/BE[1]	GND
17	GND	3.3V	_SDONE	_SBO#	GND	_PERR#	GND
16	GND	_DEVSEL#	GND	VIO	_STOP#	_LOCK#	GND
15	GND	3.3V	_FRAME#	_IRDY#	BD_SEL[n]#	_TRDY#	GND
14-12	**KEY AREA**						
11	GND	_AD[18}	_AD[17]	_AD[16]	GND	_C/BE[2]#	GND
10	GND	_AD[21]	GND	3.3V	_AD[20]	_AD[19]	GND
9	GND	_C/BE[3]	_IDSEL	_AD[23]	GND	_AD[22]	GND
8	GND	_AD[26]	GND	VIO	_AD[25]	_AD[24]	GND
7	GND	_AD[30]	_AD[29]	_AD[28]	GND	_AD[27]	GND
6	GND	REQ[N]#	GND	3.3V	CLK[N]	_AD[31]	GND
5	GND	_BRSVP1A5	_BRSVP1B5	RST[N]#	GND	GNT[N]#	GND
4	GND	_BRSVP1A4	HLTY[N]#	VIO	_INTP	_INTS	GND
3	GND	_INTA#	_INTB#	_INTC#	5V	_INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	-12V	TRST#	+12V	5V	GND

Signals beginning with an underscore (_) are prefixed with the bus name:

*For boards located in slots 1-6 (Domain A), the signal name is prefixed with PCI_A (for example, PCI_A_AD[49]).

*For boards located in slots 11-16 (Domain B), the signal name is prefixed with PCI_B (for example, PCI_B_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Signal A_ENUM# in Domain A (slots 1-6), B_ENUM# in Domain B (Slots 11-16).

Primary (Front) Side CPU Slot Connectors (7 and 9)

Table 10-6. P5 Connector, CPU Slots 7 and 9

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	I/O	I/O	I/O	I/O	I/O	GND
21	GND	I/O	I/O	I/O	I/O	I/O	GND
20	GND	I/O	I/O	I/O	I/O	I/O	GND
19	GND	I/O	I/O	I/O	I/O	I/O	GND
18	GND	I/O	I/O	I/O	I/O	I/O	GND
17	GND	I/O	I/O	I/O	I/O	I/O	GND
16	GND	I/O	I/O	I/O	I/O	I/O	GND
15	GND	I/O	I/O	I/O	I/O	I/O	GND
14	GND	I/O	I/O	I/O	I/O	I/O	GND
13	GND	I/O	I/O	I/O	I/O	I/O	GND
12	GND	I/O	I/O	I/O	I/O	I/O	GND
11	GND	I/O	I/O	I/O	I/O	I/O	GND
10	GND	_TR0#	_WPROT#	_RDATA#	_HDSEL#	_DSKCHG#	GND
9	GND	_MTR1#	_DIR#	_STEP#	_WDATA#	_WGATE#	GND
8	GND	_RSV1#	_INDEX#	_MTR0#	_DS1#	A_DS0#	GND
7	GND	**_CS1FX#**	**_CS3FX#**	**_DA1**	**_DASP#**	_RSV0#	GND
6	GND	_IOCS16#	I/O	_PDIAG#	_DA0	_DA2	GND
5	GND	**_DMARQ**	**_IORDY**	**_DIOW#**	**_DMACK#**	**_DIOR#**	GND
4	GND	**_D14**	**_D0**	**I/O**	**_D15**	**_INTRQ**	GND
3	GND	**_D3**	**_D12**	**_D2**	**_D13**	**_D1**	GND
2	GND	**_D9**	**_D5**	**_D10**	**_D4**	**_D11**	GND
1	GND	I/O	**_RST#**	**_D7**	**_D8**	**_D6**	GND

Signals in bold text are prefixed with IDE_A if the board resides in slot 7 or IDE_B if the board resides in slot 9.

Signals in shaded cells are prefixed with F_A if the board resides in slot 7 or F_B if the board resides in slot 9.

All I/O pins pass through the backplane to the transition module; they do not make any connection to the backplane.

Table 10-7. P4 Connector, CPU Slots 7 and 9

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	_AD36	_AD35	_AD34	_AD33	_AD32	GND
24	GND	_AD40	_AD39	_AD38	GND	_AD37	GND
23	GND	_AD45	_AD44	_AD43	_AD42	_AD41	GND
22	GND	_AD49	_+3.3	_AD48	_AD47	_AD46	GND
21	GND	_AD53	_AD52	_AD51	GND	_AD50	GND
20	GND	_AD57	_+3.3	_AD56	_AD55	_AD54	GND
19	GND	_AD61	_AD60	_AD59	GND	_AD58	GND
18	GND	_CBE4#	_+3.3	_PAR64	_AD63	_AD62	GND
17	GND	_REQ64#	_CBE7#	_CBE6#	GND	_CBE5#	GND
16	GND	_AD2	_+3.3	_AD1	_AD0	_ACK64#	GND
15	GND	_AD6	_AD5	_AD4	GND	_AD3	GND
14-12	**KEY AREA**						
11	GND	_AD9	_AD8	_CBE0#	GND	_AD7	GND
10	GND	_AD13	_+5	_AD12	_AD11	_AD10	GND
9	GND	_PAR	_CBE1#	_AD15	GND	_AD14	GND
8	GND	_STOP#	_+5	_LOCK#	_PERR#	_SERR#	GND
7	GND	_FRAME#	_IRDY#	_TRDY#	GND	_DEVSEL#	GND
6	GND	_AD18	_+5	_AD17	_AD16	CBE2#	GND
5	GND	_AD21	_CLK	_AD20	GND	_AD19	GND
4	GND	_CBE3#	_+5	_IDSEL	_AD23	_AD22	GND
3	GND	_AD28	_AD27	_AD26	_AD25	_AD24	GND
2	GND	_GNT#	_REQ#	_AD31	_AD30	_AD29	GND
1	GND	_INTA#	_INTB#	_INTC#	_INTD#	_RST#	GND

The _+5 and _+3 in the shaded cells are provided by the CPU board; they are not connected to the chassis power plane. These signals are prefixed with CPUA if the board resides in slot 7 or CPU B if the board resides in slot 8 (for example, CPUA_+5).

Signals beginning with an underscore (_) are prefixed with the local PCI bus name:

*For boards located in slot 7 (Domain A), the signal name is prefixed with L_PCI_A (for example, L_PCI_A_AD17).

*For boards located in slot 9 (Domain B), the signal name is prefixed with L_PCI_B (for example, L_PCI_B_AD17).

Table 10-8. P3 Connector, CPU Slots 7 and 9

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	I/O	I/O	I/O	I/O	I/O	GND
18	GND	HS_REQ_	I/O	I/O	I/O	I/O	GND
17	GND	HS_GNT_	I/O	I/O	I/O	I/O	GND
16	GND	HS_FLT_	I/O	I/O	I/O	I/O	GND
15	GND	HS_EJ_	I/O	I/O	I/O	I/O	GND
14-1	GND	I/O	I/O	I/O	I/O	I/O	GND

All I/O pins pass through the backplane to the transition module; they do not make any connection to the backplane.

If the CPU is mounted in slot 7, the HS signals will end with A (for example, HS_REQ_A).

If the CPU is mounted in slot 9, the HS signals will end with B (for example, HS_REQ_B).

Table 10-9. P2 Connector, CPU Slot 7 (Domain A)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV	RSV	RSV	GND
20	GND	CLK5	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND
17	GND	_BRSVP2A17	GND	_PRST#	_REQ6#	GNT6#	GND
16	GND	_BRSVP2A16	_BRSVP2B16	_DEG#	GND	_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND	_FAL#	REQ5#	GNT5#	GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_A (for example, PCI_A_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Table 10-9. P2 Connector, CPU Slot 7 (Domain A) (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	_SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_A (for example, PCI_A_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Table 10-10. P2 Connector, CPU Slot 9 (Domain B)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK16	GND	RSV	RSV	RSV	GND
20	GND	CLK15	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND
17	GND	_BRSVP2A17	GND	_PRST#	_REQ16#	GNT16#	GND
16	GND	_BRSVP2A16	_BRSVP2B16	_DEG#	GND	_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND	_FAL#	REQ15#	GNT15#	GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_B (for example, PCI_B_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Table 10-10. P2 Connector, CPU Slot 9 (Domain B) (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND	CLK14	GND	GNT13#	REQ14#	GNT14#	GND
2	GND	CLK12	CLK13	_SYSEN#	GNT12#	REQ13#	GND
1	GND	CLK11	GND	REQ11#	GNT11#	REQ12#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_B (for example, PCI_B_AD[49]).

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Table 10-11. P1 Connector, CPU Slots 7 and 9

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	5V	_REQ64#	A_ENUM#	3.3V	5V	GND
24	GND	_AD[1]	5V	VIO	_AD[0]	_ACK64#	GND
23	GND	3.3V	_AD[4]	_AD[3]	5V	_AD[2]	GND
22	GND	_AD[7]	GND	3.3V	_AD[6]	_AD[5]	GND
21	GND	3.3V	_AD[9]	_AD[8]	_M66EN	_C/BE[0]#	GND
20	GND	_AD[12]	GND	VIO	_AD[11]	_AD[10]	GND
19	GND	3.3V	_AD[15]	_AD[14]	GND	_AD[13]	GND
18	GND	_SERR#	GND	3.3V	_PAR	_C/BE[1]	GND
17	GND	3.3V	_SDONE	_SBO#	GND	_PERR#	GND
16	GND	_DEVSEL#	GND	VIO	_STOP#	_LOCK#	GND

Signals beginning with an underscore (_) are prefixed with the bus name:

*For boards located in slot 7 (Domain A), the signal name is prefixed with PCI_A (for example, PCI_A_AD[49]).

*For boards located in slot 9 (Domain B), the signal name is prefixed with PCI_B (for example, PCI_B_AD[49]).

Shaded cell A_ENUM# applies to Domain A; Domain B signal B_ENUM#.

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Signals enclosed in parentheses () are not used

Table 10-11. P1 Connector, CPU Slots 7 and 9 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
15	GND	3.3V	_FRAME#	_IRDY#	BD_SEL[n]#	_TRDY#	GND
14-12	**KEY AREA**						
11	GND	_AD[18}	_AD[17]	_AD[16]	GND	_C/BE[2]#	GND
10	GND	_AD[21]	GND	3.3V	_AD[20]	_AD[19]	GND
9	GND	_C/BE[3]	_IDSEL	_AD[23]	GND	_AD[22]	GND
8	GND	_AD[26]	GND	VIO	_AD[25]	_AD[24]	GND
7	GND	_AD[30]	_AD[29]	_AD[28]	GND	_AD[27]	GND
6	GND	(REQ#)	GND	3.3V	(CLK)	_AD[31]	GND
5	GND	_BRSVP1A5	_BRSVP1B5	RST[N]#	GND	(GNT#)	GND
4	GND	_BRSVP1A4	HLTY[N]#	VIO	_INTP	_INTS	GND
3	GND	_INTA#	_INTB#	_INTC#	5V	_INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	-12V	TRST#	+12V	5V	GND

Signals beginning with an underscore (_) are prefixed with the bus name:

*For boards located in slot 7 (Domain A), the signal name is prefixed with PCI_A (for example, PCI_A_AD[49]).

*For boards located in slot 9 (Domain B), the signal name is prefixed with PCI_B (for example, PCI_B_AD[49]).

Shaded cell A_ENUM# applies to Domain A; Domain B signal B_ENUM#.

RSV signals are not connected.

Signals beginning with _BRSV are bussed, but not used.

Signals enclosed in parentheses () are not used

Secondary (Rear) Side I/O Connectors

Note I/O slot connectors P2 and P1 do not connect through to the transition module.

Table 10-12. P5 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22-1	GND	I/O	I/O	I/O	I/O	I/O	GND

All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.

Table 10-13. P4 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25-15	GND	I/O	I/O	I/O	I/O	I/O	GND
14	**KEY AREA**						
13							
12							
11-1	GND	I/O	I/O	I/O	I/O	I/O	GND
All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.							

Table 10-14. P3 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19-1	GND	I/O	I/O	I/O	I/O	I/O	GND
All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.							

Primary (Front) Side I/O Connectors

The tables in the next few sections provide pin assignments for all I/O, HSC, and CPU slots. For further connector pinouts, refer to the table below.

Pinout Information for Connector:	See:
P5	Table 10-1 on page 101
P4	Table 10-15 on page 112
P3	Table 10-3 on page 102
P2	Table 10-4 on page 102
P1	Table 10-5 on page 103

Primary (Front) Side (Slots 1-6 and 11-16)

The I/O connectors for slots 1-6 and 11-16, except for the P4 connector, which carries the H.110 bus, use the same pinouts as the standard CPX8216 backplane.

Table 10-15. P4 Connector, I/O Slots 1-6, 11-16

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	NP	SGA4	SGA3	SGA2	SGA1	SGA0	FG
24	NP	GA4	GA3	GA2	GA1	GA0	FG
23	NP	+12V	CT_RST[n]#	CT_EN[n]#	-12V	CT_MC	FG
22	NP	PSF0#	RSVD	RSVD	RSVD	RSVD	FG
21	NP	-SELVbat	PSF1#	RSVD	RSVD	SELVbat RTN	FG
20	NP	NP	NP	NP	NP	NP	NP
19	NP	NP	NP	NP	NP	NP	NP
18	NP	VRG	NP	NP	NP	VRG RTN	NP
17	NP	NP	NP	NP	NP	NP	NP
16	NP	NP	NP	NP	NP	NP	NP
15	NP	-Vbat	NP	NP	NP	Vbat RTN	NP
14-12	**KEY AREA**						
11	NP	CT_D29	CT_D30	CT_D31	V(I/O)	CT_FRAME_A#	GND
10	NP	CT_D27	+3.3V	CT_D28	+5V	CT_FRAME_B#	GND
9	NP	CT_D24	CT_D25	CT_D26	GND	FR_COMP#	GND
8	NP	CT_D21	CT_D22	CT_D23	+5V	CT_C8_A	GND
7	NP	CT_D19	+5V	CT_D23	GND	CT_C8_A	GND
6	NP	CT_D16	CT_D17	CT_D18	GND	CT_NETREF_1	GND
5	NP	CT_D13	CT_D14	CT_D15	+3.3V	CT_NETREF_2	GND
4	NP	CT_D11	+5V	CT_D12	+3.3V	SCLK	GND
3	NP	CT_D8	CT_D9	CT_D10	GND	SCLK-D	GND
2	NP	CT_D4	CT_D5	CT_D6	CT_D7	GND	GND
1	NP	CT_D0	+3.3V	CT_D1	CT_D2	CT_D3	GND

NP=Not Populated. P4 implements the full H.110 Bus connections, which requires P4 to use depopulated connectors.

CT_RST1# through CT_RST6# are routed radially to the bridge slots.

CT_EN1# is connected to BD_SEL1# on the backplane, and so forth.

[n]=n is the slot number.

Refer to the H.110 specifications for line terminations.

Primary (Front) Side CPU Connectors

The CPU connectors on the CPX8216T H.110 backplane use the same pinouts as the CPX8216 standard backplane.

For Pinout Information for Connector:	See:
P5	Table 10-6 on page 105
P4	Table 10-7 on page 106
P3	Table 10-8 on page 107
P2-Domain A	Table 10-9 on page 107
P2-Domain B	Table 10-10 on page 108
P1	Table 10-11 on page 109

Primary (Front) Side HSC Connectors

The HSC/Bridge slot is unique. All five connectors (P5 through P1) use standard tails, and none of the connectors pass through to the rear.

Table 10-16. P5 Connector, HSC/Bridge (Slots 8 and 10)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	_AD36	_AD35	_AD34	_AD33	_AD32	GND
24	GND	_AD40	_AD39	_AD38	_GND	_AD37	GND
23	GND	_AD45	_AD44	_AD43	_AD42	_AD41	GND
22	GND	_AD49	_+3.3	_AD48	_AD47	_AD46	GND
21	GND	_AD53	_AD52	_AD51	_GND	_AD50	GND
20	GND	_AD57	_+3.3	_AD56	_AD55	_AD54	GND
19	GND	_AD61	_AD60	_AD59	_GND	_AD58	GND
18	GND	_CBE4#	_+3.3	_PAR64	_AD63	_AD62	GND
17	GND	_REQ64#	_CBE7#	_CBE6#	_GND	_CBE5#	GND
16	GND	_AD2	_+3.3	_AD1	_AD0	_ACK64#	GND
15	GND	_AD6	_AD5	_AD4	_GND	_AD3	GND
14-12	**KEY AREA**						
11	GND	_AD9	_AD8	_CBE0#	_GND	_AD7	GND

The _GND, _+5 and _+3 in the shaded cells are provided by the CPU board; they are not connected to the chassis power plane. These signals are prefixed with CPUA if the board resides in slot 10 or CPUB if the board resides in slot 8 (for example, CPUA_+5).

Unshaded signals beginning with an underscore (_) are prefixed with the local PCI bus name:

*For boards located in slot 10 (Domain A), the signal name is prefixed with L_PCI_A (for example, L_PCI_A_AD17).

*For boards located in slot 8 (Domain B), the signal name is prefixed with L_PCI_B (for example, L_PCI_B_AD17).

Table 10-16. P5 Connector, HSC/Bridge (Slots 8 and 10) (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
10	GND	_AD13	_+5	_AD12	_AD11	_AD10	GND
9	GND	_PAR	_CBE1#	_AD15	_GND	_AD14	GND
8	GND	_STOP#	_+5	_LOCK#	_PERR#	_SERR#	GND
7	GND	_FRAME#	_IRDY#	_TRDY#	_GND	_DEVSEL#	GND
6	GND	_AD18	_+5	_AD17	_AD16	CBE2#	GND
5	GND	_AD21	_CLK	_AD20	_GND	_AD19	GND
4	GND	_CBE3#	_+5	_IDSEL	_AD23	_AD22	GND
3	GND	_AD28	_AD27	_AD26	_AD25	_AD24	GND
2	GND	_GNT#	_REQ#	_AD31	_AD30	_AD29	GND
1	GND	_INTA#	_INTB#	_INTC#	_INTD#	_RST#	GND

The _GND, _+5 and _+3 in the shaded cells are provided by the CPU board; they are not connected to the chassis power plane. These signals are prefixed with CPUA if the board resides in slot 10 or CPUB if the board resides in slot 8 (for example, CPUA_+5).

Unshaded signals beginning with an underscore (_) are prefixed with the local PCI bus name:

*For boards located in slot 10 (Domain A), the signal name is prefixed with L_PCI_A (for example, L_PCI_A_AD17).

*For boards located in slot 8 (Domain B), the signal name is prefixed with L_PCI_B (for example, L_PCI_B_AD17).

Table 10-17. P4 Connector, HSC Slots 8 and 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	NP	SGA4	SGA3	SGA2	SGA1	SGA0	FG
24	NP	GA4	GA3	GA2	GA1	GA0	FG
23	NP	+12V	CT_RST[n]#	CT_EN[n]#	-12V	CT_MC	FG
22	NP	PSF0#	RSVD	RSVD	RSVD	RSVD	FG
21	NP	-SELVbat	PSF1#	RSVD	RSVD	SELVbat RTN	FG
20	NP	NP	NP	NP	NP	NP	NP
19	NP	NP	NP	NP	NP	NP	NP
18	NP	VRG	NP	NP	NP	VRG RTN	NP
17	NP	NP	NP	NP	NP	NP	NP
16	NP	NP	NP	NP	NP	NP	NP
15	NP	-Vbat	NP	NP	NP	Vbat RTN	NP

NP=Not Populated. P4 implements the full H.110 Bus connections, which requires P4 to use depopulated connectors.

CT_RST1# through CT_RST6# are routed radially to the bridge slots.

CT_EN1# is connected to BD_SEL1# on the backplane, and so forth.

[n]=n is the slot number.

Refer to the H.110 specifications for line terminations.

Table 10-17. P4 Connector, HSC Slots 8 and 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
14-12	**KEY AREA**						
11	NP	CT_D29	CT_D30	CT_D31	V(I/O)	CT_FRAME_A#	GND
10	NP	CT_D27	+3.3V	CT_D28	+5V	CT_FRAME_B#	GND
9	NP	CT_D24	CT_D25	CT_D26	GND	FR_COMP#	GND
8	NP	CT_D21	CT_D22	CT_D23	+5V	CT_C8_A	GND
7	NP	CT_D19	+5V	CT_D23	GND	CT_C8_A	GND
6	NP	CT_D16	CT_D17	CT_D18	GND	CT_NETREF_1	GND
5	NP	CT_D13	CT_D14	CT_D15	+3.3V	CT_NETREF_2	GND
4	NP	CT_D11	+5V	CT_D12	+3.3V	SCLK	GND
3	NP	CT_D8	CT_D9	CT_D10	GND	SCLK-D	GND
2	NP	CT_D4	CT_D5	CT_D6	CT_D7	GND	GND
1	NP	CT_D0	+3.3V	CT_D1	CT_D2	CT_D3	GND

NP=Not Populated. P4 implements the full H.110 Bus connections, which requires P4 to use depopulated connectors.

CT_RST1# through CT_RST6# are routed radially to the bridge slots.

CT_EN1# is connected to BD_SEL1# on the backplane, and so forth.

[n]=n is the slot number.

Refer to the H.110 specifications for line terminations.

Table 10-18. P3 Connector, HSC Slots 8 and 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	A/B#	ALM_B_5V	INT_HSC_2	Per3_Pwr_ON#	Per1_Pwr_ON#	GND
18	GND	HS_REQ_B	HS_REQ_A	INT_HSC_1	Per3_LED1#	Per1_LED1#	GND
17	GND	HS_GNT_B	HS_GNT_A	INT_HSC_4	Per3_LED2#	Per1_LED2#	GND
16	GND	HS_FLT_B	HS_FLT_A	INT_HSC_3	Per3_PSNT_B#	Per1_PSNT_B#	GND
15	GND	HS_EJ_B	HS_EJ_A	INT_HSC_6	Per4_Pwr_ON#	Per2_Pwr_ON#	GND
14	GND	INT_HSC_8	INT_HSC_7	INT_HSC_5	Per4_LED1#	Per2_LED1#	GND

A/B# GND Domain B (slot 8).

ALM_B_5V in Domain B (slot 8); ALM_A_5V in Domain A (slot 10).

B_ENUM# in Domain B (slot 8); A_ENUM in Domain A (slot 10).

BD_SEL7# in Domain B, BD_SEL9# in Domain A.

Table 10-18. P3 Connector, HSC Slots 8 and 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
13	GND	A_CLK	A_DOUT#	PS_1_DIN#	Per4_LED2#	Per2_LED2#	GND
12	GND	B_CLK	B_DOUT#	PS_2_DIN#	Per4_PSNT_B#	Per2_PSNT_B#	GND
11	GND	ALM_A_FRAME#	PS_1_FRAME#	PS_3_DIN#	ALM_A_DIN#		GND
10	GND	ALM_B_FRAME#	PS_2_FRAME#	PS_3_FRAME#		B_ENUM#	GND
9	GND	RST3#	RST6#	HLTY10#	RST16#	RST13#	GND
8	GND	RST2#	RST5#	HLTY9#	RST15#	RST12#	GND
7	GND	RST1#	RST4#	HLTY8#	RST14#	RST11#	GND
6	GND	BD_SEL6#	HLTY6#	HLTY7#	HLTY16#	BD_SEL16#	GND
5	GND	BD_SEL5#	HLTY5#	BD_SEL7#	HLTY15#	BD_SEL15#	GND
4	GND	BD_SEL4#	HLTY4#	RST10#	HLTY14#	BD_SEL14#	GND
3	GND	BD_SEL3#	HLTY3#	RST9#	HLTY13#	BD_SEL13#	GND
2	GND	BD_SEL2#	HLTY2#	RST8#	HLTY12#	BD_SEL12#	GND
1	GND	BD_SEL1#	HLTY1#	RST7#	HLTY11#	BD_SEL11#	GND

A/B# GND Domain B (slot 8).

ALM_B_5V in Domain B (slot 8); ALM_A_5V in Domain A (slot 10).

B_ENUM# in Domain B (slot 8); A_ENUM in Domain A (slot 10).

BD_SEL7# in Domain B, BD_SEL9# in Domain A.

Table 10-19. P2 Connector, HSC Slot 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV	RSV	RSV	GND
20	GND	CLK5	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND
17	GND	_BRSVP2A17	GND	(_PRST#)	_REQ6#	GNT6#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_B (for example, PCI_B_AD[49]).

Signals in parentheses are not used.

Table 10-19. P2 Connector, HSC Slot 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
16	GND	_BRSVP2A16	_BRSVP2B16	(_DEG#)	GND	_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND	(_FAL#)	REQ5#	GNT5#	GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	_SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_B (for example, PCI_B_AD[49]).

Signals in parentheses are not used.

Table 10-20. P2 Connector, HSC Slot 8

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK16	GND	RSV	RSV	RSV	GND
20	GND	CLK15	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_A (for example, PCI_A_AD[49]).

Signals in parentheses are not used.

Table 10-20. P2 Connector, HSC Slot 8 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
17	GND	_BRSVP2A17	GND	(_PRST#)	_REQ16#	GNT16#	GND
16	GND	_BRSVP2A16	_BRSVP2B16	(_DEG#)	GND	_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND	(_FAL#)	REQ15#	GNT15#	GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND	CLK14	GND	GNT13#	REQ14#	GNT14#	GND
2	GND	CLK12	CLK13	_SYSEN#	GNT12#	REQ13#	GND
1	GND	CLK11	GND	REQ11#	GNT11#	REQ12#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_A (for example, PCI_A_AD[49]).

Signals in parentheses are not used.

Table 10-21. P1 Connector, HSC Slots 8 and 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	5V	_REQ64#	A_ENUM#	3.3V	5V	GND
24	GND	_AD[1]	5V	VIO	_AD[0]	_ACK64#	GND
23	GND	3.3V	_AD[4]	_AD[3]	5V	_AD[2]	GND
22	GND	_AD[7]	GND	3.3V	_AD[6]	_AD[5]	GND
21	GND	3.3V	_AD[9]	_AD[8]	_M66EN	_C/BE[0]#	GND
20	GND	_AD[12]	GND	VIO	_AD[11]	_AD[10]	GND

A_ENUM# in Domain A (slot 10); B_ENUM# in Domain B (slot 8).

Table 10-21. P1 Connector, HSC Slots 8 and 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	3.3V	_AD[15]	_AD[14]	GND	_AD[13]	GND
18	GND	_SERR#	GND	3.3V	_PAR	_C/BE[1]	GND
17	GND	3.3V	_SDONE	_SBO#	GND	_PERR#	GND
16	GND	_DEVSEL#	GND	VIO	_STOP#	_LOCK#	GND
15	GND	3.3V	_FRAME#	_IRDY#	BD_SEL[n]#	_TRDY#	GND
14-12	**KEY AREA**						
11	GND	_AD[18}	_AD[17]	_AD[16]	GND	_C/BE[2]#	GND
10	GND	_AD[21]	GND	3.3V	_AD[20]	_AD[19]	GND
9	GND	_C/BE[3]	_IDSEL	_AD[23]	GND	_AD[22]	GND
8	GND	_AD[26]	GND	VIO	_AD[25]	_AD[24]	GND
7	GND	_AD[30]	_AD[29]	_AD[28]	GND	_AD[27]	GND
6	GND	REQ[N]#	GND	3.3V	CLK[N]	_AD[31]	GND
5	GND	_BRSVP1A5	_BRSVP1B5	RST[N]#	GND	GNT[N]#	GND
4	GND	_BRSVP1A4	HLTY[N]#	VIO	_INTP	_INTS	GND
3	GND	_INTA#	_INTB#	_INTC#	5V	_INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	-12V	TRST#	+12V	5V	GND
A_ENUM# in Domain A (slot 10); B_ENUM# in Domain B (slot 8).							

Secondary (Rear) Side I/O Connectors

Note I/O slot connectors P4, P2, and P1 do not connect through to the transition module.

Table 10-22. P5 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22-1	GND	I/O	I/O	I/O	I/O	I/O	GND
All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.							

Table 10-23. P3 Connector, I/O Slots 1-6 and 11-16 (User I/O)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19-1	GND	I/O	I/O	I/O	I/O	I/O	GND
All I/O pins pass through the backplane to the transition module, they do not make any connection to the backplane.							

Transition Module Slots

Hot Swap Controller/Bridge Connectors (Transition Slots 8 and 10)

The Hot Swap Controller/Bridge for Domain A resides in transition module slot 10. The Hot Swap Controller/Bridge for Domain B resides in transition module slot 8.

Table 10-24. P5 Connector, HSC/Bridge (Slots 8 and 10)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22-1	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND

Connector P5 is reserved for future use.

Table 10-25. P4 Connector, HSC/Bridge (Slots 8 and 10)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	_AD36	_AD35	_AD34	_AD33	_AD32	GND
24	GND	_AD40	_AD39	_AD38	_GND	_AD37	GND
23	GND	_AD45	_AD44	_AD43	_AD42	_AD41	GND
22	GND	_AD49	_+3.3	_AD48	_AD47	_AD46	GND
21	GND	_AD53	_AD52	_AD51	_GND	_AD50	GND
20	GND	_AD57	_+3.3	_AD56	_AD55	_AD54	GND
19	GND	_AD61	_AD60	_AD59	_GND	_AD58	GND
18	GND	_CBE4#	_+3.3	_PAR64	_AD63	_AD62	GND
17	GND	_REQ64#	_CBE7#	_CBE6#	_GND	_CBE5#	GND
16	GND	_AD2	_+3.3	_AD1	_AD0	_ACK64#	GND
15	GND	_AD6	_AD5	_AD4	_GND	_AD3	GND
14-12	**KEY AREA**						
11	GND	_AD9	_AD8	_CBE0#	_GND	_AD7	GND
10	GND	_AD13	_+5	_AD12	_AD11	_AD10	GND
9	GND	_PAR	_CBE1#	_AD15	_GND	_AD14	GND
8	GND	_STOP#	_+5	_LOCK#	_PERR#	_SERR#	GND
7	GND	_FRAME#	_IRDY#	_TRDY#	_GND	_DEVSEL#	GND

The _GND, _+5 and _+3 in the shaded cells are provided by the CPU board; they are not connected to the chassis power plane. These signals are prefixed with CPUA if the board resides in slot 10 or CPUB if the board resides in slot 8 (for example, CPUA_+5).

Unshaded signals beginning with an underscore (_) are prefixed with the local PCI bus name:

*For boards located in slot 10 (Domain A), the signal name is prefixed with L_PCI_A (for example, L_PCI_A_AD17).

*For boards located in slot 8 (Domain B), the signal name is prefixed with L_PCI_B (for example, L_PCI_B_AD17).

Table 10-25. P4 Connector, HSC/Bridge (Slots 8 and 10) (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
6	GND	_AD18	_+5	_AD17	_AD16	CBE2#	GND
5	GND	_AD21	_CLK	_AD20	_GND	_AD19	GND
4	GND	_CBE3#	_+5	_IDSEL	_AD23	_AD22	GND
3	GND	_AD28	_AD27	_AD26	_AD25	_AD24	GND
2	GND	_GNT#	_REQ#	_AD31	_AD30	_AD29	GND
1	GND	_INTA#	_INTB#	_INTC#	_INTD#	_RST#	GND

The _GND, _+5 and _+3 in the shaded cells are provided by the CPU board; they are not connected to the chassis power plane. These signals are prefixed with CPUA if the board resides in slot 10 or CPUB if the board resides in slot 8 (for example, CPUA_+5).

Unshaded signals beginning with an underscore (_) are prefixed with the local PCI bus name:

*For boards located in slot 10 (Domain A), the signal name is prefixed with L_PCI_A (for example, L_PCI_A_AD17).

*For boards located in slot 8 (Domain B), the signal name is prefixed with L_PCI_B (for example, L_PCI_B_AD17).

Table 10-26. P3 Connector, HSC Slots 8 and 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	A/B#	ALM_B_5V	INT_HSC_2	Per3_Pwr_ON#	Per1_Pwr_ON#	GND
18	GND	HS_REQ_B	HS_REQ_A	INT_HSC_1	Per3_LED1#	Per1_LED1#	GND
17	GND	HS_GNT_B	HS_GNT_A	INT_HSC_4	Per3_LED2#	Per1_LED2#	GND
16	GND	HS_FLT_B	HS_FLT_A	INT_HSC_3	Per3_PSNT_B#	Per1_PSNT_B#	GND
15	GND	HS_EJ_B	HS_EJ_A	INT_HSC_6	Per4_Pwr_ON#	Per2_Pwr_ON#	GND
14	GND	INT_HSC_8	INT_HSC_7	INT_HSC_5	Per4_LED1#	Per2_LED1#	GND
13	GND	A_CLK	A_DOUT#	PS_1_DIN#	Per4_LED2#	Per2_LED2#	GND
12	GND	B_CLK	B_DOUT#	PS_2_DIN#	Per4_PSNT_B#	Per2_PSNT_B#	GND
11	GND	ALM_A_FRAME#	PS_1_FRAME#	PS_3_DIN#	ALM_A_DIN#		GND
10	GND	ALM_B_FRAME#	PS_2_FRAME#	PS_3_FRAME#		B_ENUM#	GND
9	GND	RST3#	RST6#	HLTY10#	RST16#	RST13#	GND
8	GND	RST2#	RST5#	HLTY9#	RST15#	RST12#	GND

A/B# GND Domain B (slot 8).

ALM_B_5V in Domain B (slot 8); ALM_A_5V in Domain A (slot 10).

B_ENUM# in Domain B (slot 8); A_ENUM in Domain A (slot 10).

BD_SEL7# in Domain B, BD_SEL9# in Domain A.

Table 10-26. P3 Connector, HSC Slots 8 and 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
7	GND	RST1#	RST4#	HLTY8#	RST14#	RST11#	GND
6	GND	BD_SEL6#	HLTY6#	HLTY7#	HLTY16#	BD_SEL16#	GND
5	GND	BD_SEL5#	HLTY5#	BD_SEL7#	HLTY15#	BD_SEL15#	GND
4	GND	BD_SEL4#	HLTY4#	RST10#	HLTY14#	BD_SEL14#	GND
3	GND	BD_SEL3#	HLTY3#	RST9#	HLTY13#	BD_SEL13#	GND
2	GND	BD_SEL2#	HLTY2#	RST8#	HLTY12#	BD_SEL12#	GND
1	GND	BD_SEL1#	HLTY1#	RST7#	HLTY11#	BD_SEL11#	GND

A/B# GND Domain B (slot 8).
ALM_B_5V in Domain B (slot 8); ALM_A_5V in Domain A (slot 10).
B_ENUM# in Domain B (slot 8); A_ENUM in Domain A (slot 10).
BD_SEL7# in Domain B, BD_SEL9# in Domain A.

Table 10-27. P2 Connector, HSC Slot 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV	RSV	RSV	GND
20	GND	CLK5	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND
17	GND	_BRSVP2A17	GND	(_PRST#)	_REQ6#	GNT6#	GND
16	GND	_BRSVP2A16	_BRSVP2B16	(_DEG#)	GND	_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND	(_FAL#)	REQ5#	GNT5#	GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_B (for example, PCI_B_AD[49]).
Signals in parentheses are not used.

Table 10-27. P2 Connector, HSC Slot 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	_SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_B (for example, PCI_B_AD[49]).

Signals in parentheses are not used.

Table 10-28. P2 Connector, HSC Slot 8

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK16	GND	RSV	RSV	RSV	GND
20	GND	CLK15	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	_BRSVP2A18	_BRSVP2B18	_BRSVP2C18	GND	_BRSVP2E18	GND
17	GND	_BRSVP2A17	GND	(_PRST#)	_REQ16#	GNT16#	GND
16	GND	_BRSVP2A16	_BRSVP2B16	(_DEG#)	GND	_BRSVP2E16	GND
15	GND	_BRSVP2A15	GND	(_FAL#)	REQ15#	GNT15#	GND
14	GND	_AD[35]	_AD[34]	_AD[33]	GND	_AD[32]	GND
13	GND	_AD[38]	GND	VIO	_AD[37]	_AD[36]	GND
12	GND	_AD[42]	_AD[41]	_AD[40]	GND	_AD[39]	GND
11	GND	_AD[45]	GND	VIO	_AD[44]	_AD[43]	GND
10	GND	_AD[49]	_AD[48]	_AD[47]	GND	_AD[46]	GND
9	GND	_AD[52]	GND	VIO	_AD[51]	_AD[50]	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_A (for example, PCI_A_AD[49]).

Signals in parentheses are not used.

Table 10-28. P2 Connector, HSC Slot 8 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
8	GND	_AD[56]	_AD[55]	_AD[54]	GND	_AD[53]	GND
7	GND	_AD[59]	GND	VIO	_AD[58]	_AD[57]	GND
6	GND	_AD[63]	_AD[62]	_AD[61]	GND	_AD[60]	GND
5	GND	_C/BE[5]#	GND	VIO	C/BE[4]#	_PAR64	GND
4	GND	VIO	_BRSVP2B4	_C/BE[7]#	GND	_C/BE[6]	GND
3	GND	CLK14	GND	GNT13#	REQ14#	GNT14#	GND
2	GND	CLK12	CLK13	_SYSEN#	GNT12#	REQ13#	GND
1	GND	CLK11	GND	REQ11#	GNT11#	REQ12#	GND

Signals beginning with an underscore (_) are prefixed with the bus name PCI_A (for example, PCI_A_AD[49]).

Signals in parentheses are not used.

Table 10-29. P1 Connector, HSC Slots 8 and 10

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	5V	_REQ64#	A_ENUM#	3.3V	5V	GND
24	GND	_AD[1]	5V	VIO	_AD[0]	_ACK64#	GND
23	GND	3.3V	_AD[4]	_AD[3]	5V	_AD[2]	GND
22	GND	_AD[7]	GND	3.3V	_AD[6]	_AD[5]	GND
21	GND	3.3V	_AD[9]	_AD[8]	_M66EN	_C/BE[0]#	GND
20	GND	_AD[12]	GND	VIO	_AD[11]	_AD[10]	GND
19	GND	3.3V	_AD[15]	_AD[14]	GND	_AD[13]	GND
18	GND	_SERR#	GND	3.3V	_PAR	_C/BE[1]	GND
17	GND	3.3V	_SDONE	_SBO#	GND	_PERR#	GND
16	GND	_DEVSEL#	GND	VIO	_STOP#	_LOCK#	GND
15	GND	3.3V	_FRAME#	_IRDY#	BD_SEL[n]#	_TRDY#	GND
14-12	**KEY AREA**						
11	GND	_AD[18}	_AD[17]	_AD[16]	GND	_C/BE[2]#	GND
10	GND	_AD[21]	GND	3.3V	_AD[20]	_AD[19]	GND
9	GND	_C/BE[3]	_IDSEL	_AD[23]	GND	_AD[22]	GND
8	GND	_AD[26]	GND	VIO	_AD[25]	_AD[24]	GND
7	GND	_AD[30]	_AD[29]	_AD[28]	GND	_AD[27]	GND

A_ENUM# in Domain A (slot 10); B_ENUM# in Domain B (slot 8).

Table 10-29. P1 Connector, HSC Slots 8 and 10 (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
6	GND	REQ[N]#	GND	3.3V	CLK[N]	_AD[31]	GND
5	GND	_BRSVP1A5	_BRSVP1B5	RST[N]#	GND	GNT[N]#	GND
4	GND	_BRSVP1A4	HLTY[N]#	VIO	_INTP	_INTS	GND
3	GND	_INTA#	_INTB#	_INTC#	5V	_INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	-12V	TRST#	+12V	5V	GND
A_ENUM# in Domain A (slot 10); B_ENUM# in Domain B (slot 8).							

CPU Transition Module Connectors (Transition Slots 7 and 9)

Note CPU transition module connectors P4, P2, and P1 are not connected.

Table 10-30. P5 Connector, CPU Transition Module Slots

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	I/O	I/O	I/O	I/O	I/O	GND
21	GND	I/O	I/O	I/O	I/O	I/O	GND
20	GND	I/O	I/O	I/O	I/O	I/O	GND
19	GND	I/O	I/O	I/O	I/O	I/O	GND
18	GND	I/O	I/O	I/O	I/O	I/O	GND
17	GND	I/O	I/O	I/O	I/O	I/O	GND
16	GND	I/O	I/O	I/O	I/O	I/O	GND
15	GND	I/O	I/O	I/O	I/O	I/O	GND
14	GND	I/O	I/O	I/O	I/O	I/O	GND
13	GND	I/O	I/O	I/O	I/O	I/O	GND
12	GND	I/O	I/O	I/O	I/O	I/O	GND
11	GND	I/O	I/O	I/O	I/O	I/O	GND
10	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
9	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
8	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
All I/O pins pass through the backplane; they do not make any connection to the backplane. All RSVD pins are internally connected and pass through. They are reserved for the IDE and Floppy drive signals; the transition module should avoid connections to these pins.							

Table 10-30. P5 Connector, CPU Transition Module Slots (continued)

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
7	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
6	GND	RSVD	I/O	RSVD	RSVD	RSVD	GND
5	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
4	GND	RSVD	RSVD	I/O	RSVD	RSVD	GND
3	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
2	GND	RSVD	RSVD	RSVD	RSVD	RSVD	GND
1	GND	I/O	RSVD	RSVD	RSVD	RSVD	GND

All I/O pins pass through the backplane; they do not make any connection to the backplane.

All RSVD pins are internally connected and pass through. They are reserved for the IDE and Floppy drive signals; the transition module should avoid connections to these pins.

Table 10-31. P3 Connector, CPU Transition Slots 7 and 9

POS	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	I/O	I/O	I/O	I/O	I/O	GND
18	GND	RSVD	I/O	I/O	I/O	I/O	GND
17	GND	RSVD	I/O	I/O	I/O	I/O	GND
16	GND	RSVD	I/O	I/O	I/O	I/O	GND
15	GND	RSVD	I/O	I/O	I/O	I/O	GND
14-1	GND	I/O	I/O	I/O	I/O	I/O	GND

All I/O pins pass through the backplane, they do not make any connection to the backplane.

All RSVD pins are internally connected and pass through. They are reserved for the IDE and Floppy drive signals; the transition module should avoid connections to these pins.

Secondary (Rear) Side CPU Transition Module Connectors

The CPU transition module connectors use the same pinouts as the connectors in the CPX8216 standard backplane.

Note CPU connectors P4, P2, and P1 do not pass through the backplane.

For Pinout Information for Connector:	See:
P5	Table 10-30 on page 125
P3	Table 10-31 on page 126

Alarm Interface Connector (ALARM)

The alarm interface connector is located on the secondary side of the backplane. Alarm signals are routed through the backplane to the ALARM connector. The alarm board attaches to this connector by ribbon cable.

Table 10-32. ALARM Connector Pin Assignments

Pin	Signal	Pin	Signal
1	ALM_A_CLK	2	GND
3	ALM_B_CLK	4	GND
5	ALM_A_DOUT#	6	ALM_A_5V
7	ALM_B_DOUT#	8	ALM_B_5V
9	ALM_A_FRAME#	10	ALM_B_FRAME#
11	ALM_A_DIN#	12	

Power Supply Connectors (PS1, PS2, PS3)

The three power supply connectors, PS1, PS2, and PS3, are located on the primary side of the backplane.

Note The shaded pins are high current pins. Present[n]# is grounded on the backplane.

Table 10-33. PS1, PS2, and PS3 Pin Assignments

Pin	Signal	Signal	Pin
1	GND	Present[n]#	16
2	GND	-12Vdc	17
3	+3.3Vdc	A_DOUT#	18
4	+3.3Vdc	PS[n]_DIN#	19
5	+S5Vdc	-12Vdc	20
6	-S5Vdc	N/C	21
7	+5_Share	N/C	22
8	+S3.3Vdc	N/C	23
9	-S3.3Vdc	N/C	24
10	+3.3_Share	N/C	25
11	+12Vdc	+5Vdc	26
12	+12Vdc	+5Vdc	27
13	+12Vdc	GND	28
14	A_CLK	GND	29
15	PS[n]_FRAME#		

Table 10-34. Fan Module Pin Assignments

Pin	Signal	Color	Pin	Signal	Color
1	N/C		6	N/C	
2	+12V_System In	Grey	7	+12V_System Out	Brown
3	+12V_Fan	Red	8	+12V_Fan_Rtn	Black
4	Tach	Blue	9	Speed Ctl	Yellow
5	N/C		10	N/C	

H.110 Power Connector (CPX8216T Only)

H.110 BAT and Ring voltages are supplied to the backplane directly from the Power Distribution Panel. This section applies to CPX8216T chassis only.

Table 10-35. H.110 Power Connector

Pin	Signal
1	-Vbat
2	Vbat RTN
3	-SELVbat
4	SELVbat RTN
5	VRG
6	VRG RTN

Peripheral Power Connectors (PWR1, PWR2, PWR3, PWR4)

The four peripheral power connectors are located on the secondary side of the CPX8216 backplane. All four connectors have the same pin-out and can be used interchangeably.

Table 10-36. PWR1, PWR2, PWR3, PWR4 Pin Assignments

Pin	Signal
1	+5 Volts
2	Ground
3	Ground
4	+12 Volts

Peripheral Signal Connectors (SIG1, SIG2, SIG3, SIG4)

The four peripheral signal connectors are located on the secondary side of the CPX8216 backplane. All four connectors have the same pin-out. The connectors map to different locations in the Hot Swap Controller peripheral registers, and cannot be used interchangeably.

Table 10-37. SIG1, SIG2, SIG3, SIG4 Pin Assignments

Pin	Signal
1	Per[n]_Pwr_ON#
2	Per[n]_LED1#
3	Per[n]_LED2#
4	Per[n]_PSNT_A#
5	Per[n]_PSNT_B#

Alarm Display Panel Interface Connector (J4)

Connector J4 receives system alarm signals from the backplane connector ALARM.

Table 10-38. Alarm Display Panel Interface Connector (J4)

Pin	Signal	Pin	Signal
1	ALM_A_CLK	2	GND
3	ALM_B_CLK	4	GND
5	ALM_A_DOUT#	6	ALM_A_5V
7	ALM_B_DOUT#	8	ALM_B_5V
9	ALM_A_FRAME#	10	ALM_B_FRAME#
11	ALM_A_DIN#	12	
13		14	

Remote Alarm Connector (J1)

The RJ-45 remote alarm connector (J1) provides standard telco alarm signals to remote alarm equipment. The connector also has a jacket shield to protective earth ground through two separate pins (E1 and E2).

Table 10-39. Remote Alarm Connector (J1)

Pin	Signal	Signal	Pin
1	Critical Alarm	Minor Alarm	5
2	Critical Alarm Return	Minor Alarm Return	6
3	Major Alarm	Rack Alarm	7
4	Major Alarm Return	Rack Alarm Return	8

Drive Connectors

Floppy Drive (FDA, FDB)

The backplane supports two standard IDE floppy drives. The floppy drive connectors, FDA and FDB, are located on the secondary side of the backplane. FDA is controlled by domain A, and FDB is controlled by domain B.

Table 10-40. FDA and FDB Pin Assignments

Pin	Signal	Signal	Pin
1	GND	Not Connected	2
3	GND	Not Connected	4
5	Key (pin missing0	Not Connected	6
7	GND	F_[n]_INDEX#	8
9	GND	F_[n]_MTRO#	10
11	GND	F_[n]_DS1#	12
13	GND	F_[n]_DS0#	14
15	GND	F_[n]_MTR1#	16
17	GND	F_[n]_DIR#	18
19	GND	F_[n]_STEP#	20
21	GND	F_[n]_WDATA#	22
23	GND	F_[n]_WGATE#	24
25	GND	F_[n]_TR0#	26

Table 10-40. FDA and FDB Pin Assignments (continued)

Pin	Signal	Signal	Pin
27	GND	F_[n]_WPROT#	28
29	GND	F_[n]_RDATA#	30
31	GND	F_[n]_HDSEL#	32
33	GND	F_[n]_DSKCHG#	34

IDE Drive (IDEA and IDEB)

The two IDE drive connectors are located on the secondary side of the backplane. IDEA is controlled by Domain A; IDEB by Domain B.

Table 10-41. IDEA and IDEB Pin Assignments

Pin	Signal	Signal	Pin
1	IDE_[n]_RST#	GND	2
3	IDE_[n]_D7	IDE_[n]_D8	4
5	IDE_[n]_D6	IDE_[n]_D9	6
7	IDE_[n]_D5	IDE_[n]_D10	8
9	IDE_[n]_D4	IDE_[n]_D11	10
11	IDE_[n]_D3	IDE_[n]_D12	12
13	IDE_[n]_D2	IDE_[n]_D13	14
15	IDE_[n]_D1	IDE_[n]_D13	16
17	IDE_[n]_D0	IDE_[n]_D15	18
19	GND	No Connect	20
21	IDE_[n]_DMARQ	GND	22
23	IDE_[n]_DIOW#	GND	24
25	IDE_[n]_DIOR#	GND	26
27	IDE_[n]_IORDY	No Connect	28
29	IDE_[n]_DMACK#	GND	30
31	IDE_[n]_INTRQ	IDE_[n]_IOCS16#	32
33	IDE_[n]_DA1	IDE_[n]_PDIAG#	34
35	IDE_[n]_DA0	IDE_[n]_DA2	36
37	IDE_[n]_CS1FX#	IDE_[n]_CS3FX#	38
39	IDE_[n]_DASP	GND	40

Specifications

A

Environmental Characteristics

ENVIRONMENTAL CHARACTERISTICS

Temperature	
Operating:	0º to 50º C (32º to 122º F) continuous duty with linear current derating between +50º C to +60º C (122º to 140º F) to 50% maximum rated power
Storage and Transit:	-25º TO +85º C (-13º to 185º F)
Maximum Altitude	
Operating:	Linear current derating to 85% between 8,000 feet and 12,000 feet
Storage and Transit:	30,000 feet
Shock	No degradation at 25g shock of 11ms duration at 1/2 sine wave in three planes.
Vibration	No degradation at sine 10 to 100 to 10Hz to 2g 10min/decade three planes. Meets NEBS Bellcore TR-NWT-000063, Zone 4 Earthquake Vibration
Acoustic Noise	Maximum sound level 70dbA (measured at 1 meter from the power supply at all points around it using a sound-level meter meeting ANSI Standard S1.4-1983, General Purpose Sound-Level Meter)
Cooling	The power supply meets all specifications when cooled by the fan in its sub enclosure within the restriction of the chassis enclosure.

Power Supply Electrical Specifications

AC Input

AC Voltage: 90 Vac to 132 Vac or 190 Vac to 260 Vac (autoranging)

AC Frequency: 47 Hz to 63 Hz

Power Factor: Minimum 0.98 at full load and nominal line

Turn-on Surge Current: 20 Amps at +/- 2A for one line cycle

Efficiency: -72% typical at full load and nominal line, including output Oring diodes

Input Current: Measured 6.0A maximum at 115 Vac, 3A maximum at 230 Vac at 475 watts

DC Input

DC Voltage: -36 Vdc to -72 Vdc (autoranging)

Turn-on Threshold: -38.5 Vdc to -41Vdc

Turn-on Surge Current: 20 Amps at -36 Vdc maximum in less than 4 msec.

Efficiency: 70% minimum at full load and nominal line, including output Oring diodes

Input Current: Measured 13A @ -48 Vdc at 475W

Output

All measurements are made at the output connector of the power supply. The power supply is used in an N+1 power system. Each voltage output supports power sharing.

Minimum Load Operation: None

Total Regulation: Total regulation is any combination of line, load and cross regulation, actual set point (as a deviation from the nominal set point), warm up, and temperature that results in an output voltage that deviates from the nominal set point. Table A-1 provides the total regulation for each output:

Table A-1. Total Regulation (per Output)

Output Number	Voltage	Set Point at Load	Maximum Current	Loads	Total Regulation
V1	+5.0V	+5.06Vdc@20A +/- 5 mV	40A	0 to 40A	±3%
V2	+3.3V	+3.36Vdc@20A +/- 5 mV	40A	0 to 40A	±3%
V3	+12.0V	+12.1Vdc@4A +/- 24 mV	10.4A cont. (11.5A peak for max. 5 sec.)	0 to 10.4A	±5%
V4	-12.0V	-12.1Vdc@2A +/- 12 mV	4A	0 to 4A	±5%

Output Power

400 Watts total continuous maximum from all outputs. Any mix of outputs totaling 400W is acceptable.

DC Output Voltage Adjustment

No output adjustments.

Output Noise

Total periodic and random deviation (PARD) noise found on outputs of the power module shall be, as measured at the backplane:

-From 0 to 30 MHz bandwidth for ripple <50 mV

-From 0 to 100 MHz bandwidth for spikes <75 mV

Overload Protection

All DC outputs have a method to protect the power supply from overloads and shorts. When one output is overloaded, then all outputs are turned off. Cycling the AC or DC input off then on will cause the power supply to attempt recovery.

Output to Output Short Protection

The power supply provides protection when any output is shorted to any other output. A short is considered to be any interconnection that results in any output deviating from its regulation range by more than 0.7 Volts. Cycling the AC or DC input off then on will cause the power supply to attempt recovery.

Overshoot	Overshoot does not exceed 2.0% of any output voltage under the following conditions: power failure, enabled, disabled, and AC input cycled on/off. Overshoot is the phenomena where the magnitude of voltage of an output temporarily exceeds its final or stabilized value.
Load Change Transient Response	Any DC voltage returns to 1% within 2mS in response to a 25% change in the load. The +5V output does not vary more than 3% in response to a 25% change in load. The 12V output does not go out of regulation during a 0.5A change in the +12V load.
Proper Operation During Dynamic Loads	The power supply operates properly when subjected to a 10% delta dynamic load with a 50% duty cycle at all frequencies from zero to 2 MHz, or 2 times the switching frequency of the power supply, whichever is greater.
Undershoot and Reverse Voltage	With respect to its normal zero reference voltage, no output voltage shall under any normal condition, become of a polarity opposite to its normal operation polarity (excluding applying an external reverse voltage).
Output Risetime	The +5V output will have a monotonic rise from 2V to 4.75V. The +5V output will transition from +2V to +4.75V in less than 50ms when loaded to 37.5A or less. The +5V output will always be above +3.3V output. The +3.3V output will transition from +2V to 13.3V in less than 50ms. The skew in risetime between +5V and +3.3V outputs will be less than 50mS. The +12V output will transition from +2V to +10.8V in less than 50ms. The above conditions will be over the complete input range and load range, from minimum to maximum load with a capacitive load.
Holdover Storage	Output voltage stays within regulation limits for at least 20ms from the last peak of the line voltage cycle after input power is removed. The power supply does not latch off during an AC line loss condition that is less than the hold up time.
Over Voltage Protection	A Single Fault condition is the failure of any one device within the power supply. The condition includes both the shorting of any output and the failure of any one device within the power supply. Under any single fault condition: The +5V outputs limit voltage at 6.4Vdc maximum. The +3.3V output limits voltage at 4.2Vdc maximum The ±12V outputs do not exceed ±15.0Vdc, respectively.
Control Signals	ENABLE POWER# (Input to Power Supply): Turns on and off the power supply outputs. When the Enable Power# signal is low, the power supply will be ON. When the Enable Power# signal is high or open, the power supply will be OFF. POWER GOOD# (Output from Power Supply): This signal is low when the power supply output voltages are good. The signal is high when the power supply voltages are bad. The voltage is good when it is within ±5% of the set voltage.

NEBS

The CPX8216 meets the requirements of the Bellcore Network Equipment Building System (NEBS) Requirements: Physical Protection, GR-63-CORE and the Electromagnetic Compatibility and Electrical Safety—Generic Criteria for Network Telecommunication Equipment, GR-1089-CORE as listed in the following table. The product has been tested to the requirements for NEBS Level 3 criteria.

Table A-2. NEBS Specification Compliance

Criteria	NEBS Specification	Reference
Temperature	Normal: 5° C to 40° C Short term: -5° C to 55° C	GR-63-CORE, R4-7
Relative Humidity	Normal: 5% to 85% (noncondensing and condensing) Short term: -5% to -9%	GR-63-CORE, R4-7
Office Vibration	0.1 G @ 5-100 Hz with 0.1 octave/min. 1.5 G @ 100-500 Hz with 0.25 octave/min.	GR-63-CORE, R4-56 GR-63-CORE, R4-57
Transportation Vibration	0.5 G @ 5-50 Hz, 0.1 octaves/min. 3.0 G @ 50-500 Hz, 0.5 octaves/min.	GR-63-CORE R4-58
Earthquake	N/A	GR-63-CORE, R4-44 to O-55
Drop	Packaged: 300 mm drop height Unpackaged: 25 mm drop height	GR-63-CORE, R4-41 GR-63-CORE, R4-43
Altitude	-60 to 1800 m ASL without temp. derating 1800 to 4000 m ASL with temp. derating	R-63-CORE, R4-8 R-63-CORE, R4-9 R-63-CORE, O4-9
Acoustic Noise	60 dBA @ 600 mm	GR-63-CORE, O4-62

Table A-2. NEBS Specification Compliance (continued)

Criteria	NEBS Specification	Reference
Heat Dissipation	Documentation 300/w/m^2/m max per shelf 38° C max. aisle-facing surface temp @ 26° C ambient	GR-63-CORE, R4-11 GR-63-CORE, R4-12 GR-63-CORE, O4-13
Fire Resistance and Materials	All material UL94V-1 or better. See GR-63-CORE, Section 4.2	GR-63-CORE, R4-14 to O4-40
Illumination	See GR-63-CORE, Section 4.7	GR-63-CORE, R4-63 to O4-69
Airborne Contaminant	Sulfate: 30 µg/m^3 Nitrite: 12 µg/m^3 Volatile organics: 12 µg/m^3 Sulfur Dioxide: 12 ppb Hydrogen Sulfide: 40 ppb Ammonia: 50 ppb NO: 50 ppb NO_2: 250 ppb HNO_3: 50 ppb Ozone: 250 ppb HCL+Cl_2: 6 ppb	GR-63: R4-59, O4-60

Systeminstallationsanleitung

B

Empfangen und Auspacken

Dem Gerät sollte eine Teileliste beiliegen, die alle im Lieferumfang des Systems enthaltenen Teile auflistet. Vergleichen Sie diese Teileliste mit den erhaltenen Teilen. Sollte die Teileliste mit den erhaltenen Teilen nicht übereinstimmen, benachrichtigen Sie unverzüglich den Lieferungsagenten und Emerson. Alle mit dem System bestellten Optionen sind werkseitig installiert und nicht separat auf der Teileliste aufgelistet. Bewahren Sie die Versandkartons auf, um sie ggf. wiederverwenden zu können.

Hinweis Falls die Versandkartons bei Empfang beschädigt sind, sollten Sie den Lieferungsagenten bitten, bei dem Auspacken und der Inspektion des Geräts anwesend zu sein.

1. Stellen Sie sicher, daß sich der Verpackungskarton in aufrechter Position befindet.
2. Schneiden Sie das Verpackungsklebeband vorsichtig mit einem Schneidemesser auf, und öffnen Sie dann den Karton.
3. Entfernen Sie die Kartonverpackung, das Schaumstoff-verpackungsmaterial und die schützende Plastikverpackung.
4. Heben Sie das Chassis vorsichtig aus dem Karton, und plazieren Sie es an dem gewünschten Aufstellungsort.

Richtlinien zum Aufstellen des Systems

Bei der Wahl des Systemstandorts empfiehlt es sich, folgende Punkte in Betracht zu ziehen:

1. Stabilität. Stellen Sie das System in einem Bereich auf, der vor übermäßigen Bewegungen und Erschütterungen geschützt ist.
2. Sicherheit. Installieren Sie das System im Hinblick auf Sicherheit. Sorgen Sie dafür, daß Kabel und Drähte den Zugang nicht behindern.
3. Zugang. Stellen Sie das System so auf, daß es problemlos gewartet werden kann. Bei Wartungsarbeiten ist Zugang zur Vorder- und Rückseite des Systems erforderlich.
4. Betriebsumgebung. Stellen Sie das System in einem Bereich auf, an dem es Hitze, Staub, Rauch und elektrostatischer Entladung (ESE) nicht ausgesetzt ist.
5. Kühlung. Lassen Sie Platz für eine ausreichende Luftzirkulation zur Kühlung. Stellen Sie sicher, daß vor und hinter dem System mindestens 10 cm Freiraum gelassen wird. (Zusätzliche Richtlinien zur Kühlung des Gerätes finden Sie im nächsten Abschnitt.)

Kühlen des Gehäuses

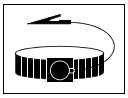
Es ist äußerst wichtig, daß alle Geräte eines Systems sachgemäß gekühlt werden. Die Eingangslufttemperatur der Systemkomponenten muß im allgemeinen unter 50º C (122º F) liegen. Interne, durch Gleichstrom betriebene Ventilatoren kühlen die Laufwerke und Module des Systems ab. Die Übergangsmodule an der Rückseite des Chassis werden durch natürliche Konvektion gekühlt. Um eine ausreichende Kühlung zu gewährleisten, sollten Sie:

- Vor und hinter dem System mindestens 10 cm Freiraum lassen.
- Sicherstellen, daß die Verkleidungen aufgesetzt, alle vorderen und rückwärtigen Schlitze gefüllt und alle Öffnung abgedeckt sind.
- Alle nicht verwendeten Modulschlitze abdecken.

Bei der Installation des Systems in einer bestimmten Betriebsumgebung sollten die technischen Daten zur Betriebsumgebung der Systemkomponenten beachtet werden. Zum Beispiel: Bei Umgebungstemperaturen über 50º C (122º F) wird der Betrieb von Disketten- und Festplattenlaufwerken nicht mehr zuverlässig. Im Falle eines Gerätes, das in einem Gehäuse installiert ist, sollten Sie beachten, daß die interne Umgebungstemperatur unter Umständen über die maximal mögliche, externe Umgebungstemperatur ansteigen kann.

ESE und Sicherheit

ESE-Anti-statikband



verwenden

Emerson empfiehlt, bei allen Installations- oder Aufrüstarbeiten am System ein Antistatikband und eine ableitende Schaumstoffunterlage zu verwenden. Elektronische Komponenten, wie z.B. Plattenlaufwerke, Platinen und Speichermodule, können gegen ESE äußerst empfindlich sein. Nach dem Entfernen des Bauteils aus dem System oder aus der Schutzhülle wird das Bauteil flach auf eine geerdete und statikfreie Oberfläche gelegt, und im Falle einer Platine mit der Komponentenseite nach oben. Das Bauteil nicht auf der Oberfläche hin und her bewegen.

Ist kein ESE-Arbeitsplatz verfügbar, so können ESE-Gefahren durch das Tragen eines Antistatikbands (in Elektronik-Fachgeschäften erhältlich) vermieden werden. Dabei ist ein Ende des Bandes um das Handgelenk zu legen. Das Erdungsende (normalerweise ein Stück Kupferfolie oder eine Krokodilklemme) an einer elektrischen Masseverbindung anschließen. Hierbei kann es sich um ein Stück Metall handeln, das direkt zur Erde führt (z.B. ein unbeschichtetes Metallrohr) oder ein Metallteil eines geerdeten, elektrischen Gerätes. Ein elektrisches Gerät ist geerdet, wenn es einen dreistiftigen Schukostecker besitzt, der in eine Schuko-Steckdose gesteckt wird. Das System selbst kann nicht als Masseverbindung verwendet werden, weil es bei allen Arbeiten vom Netz getrennt wird.

Warnung

Vor dem Ausführen dieser Verfahren ist die Stromzufuhr des Systems auszuschalten und das System vom Stromnetz zu trennen. **Wenn der Strom vor dem Öffnen des Systems nicht ausgeschaltet wird, besteht die Gefahr von Körperverletzungen und Beschädigungen des Gerätes. Im Gerät sind gefährliche Spannungen, Strom und Hochenergie vorhanden. An den Anschlußpunkten der Betriebsschalter können**

gefährliche Spannungen anliegen, auch wenn sich der Schalter in der ausgeschalteten Position befindet. Das System darf nicht bei abgenommener Gehäuseabdeckung betrieben werden. Vor dem Einschalten des Systems ist die Gehäuseabdeckung stets anzubringen.

Sicherheits- und Betriebsnormen

Diese Systeme entsprechen den Sicherheits- und Betriebsnormen, die für einzelne Geräteteile gelten. Es ist jedoch möglich, dieses Produkt mit anderen Einzelteilen zusammen zu verwenden, die ein System ergeben, welches nicht den Systemrichtlinien entspricht. Da Emerson nicht voraussehen kann, welche Geräte mit diesem Gehäuse verwendet werden oder wie dieses Gehäuse verwendet wird, sind der Systemintegrator und der Installateur völlig dafür verantwortlich, daß das gesamte fertiggestellte System den Sicherheitsanforderungen von CSA/VDE sowie den EMI/HFI-Emissionsgrenzen entspricht.

Vorsichtshinweise zur Lithium-Batterie

Dieses System enthält Lithium-Batterien.

Vorsicht

Bei einem inkorrekten Auswechseln der Lithium-Batterien besteht Explosionsgefahr. Wechseln Sie die Batterien nur mit dem gleichen oder einem gleichwertigen Batterietyp, der von dem Gerätehersteller empfohlen ist, aus. Entsorgen Sie gebrauchte Batterien gemäß den Herstelleranweisungen.

Vorsicht

Bitte nehmen Sie vor Ort keine Wartung bzw. Austausch der Lithium-Batterien selber vor. Um die Batterien sachgemäß warten oder auswechseln zu lassen, setzen Sie sich mit Ihrem Emerson-Servicevertreter in Verbindung.

Stromkreisbelastung

Das System muß von einem völlig dedizierten Stromunterbrecher mit Netzstrom versorgt werden. Schließen Sie kein anderes elektrisches Gerät an eine Steckdose an, die mit dem Stromunterbrecher verbunden ist, der das Rack-Gerät mit Strom versorgt. Wenn der Stromkreis überlastet wird und der Stromunterbrecher den Stromkreis unterbricht, besteht die Gefahr von Datenverlust.

Installation in ein 19-Zoll-Rack

Um das Gerät in ein Rack einzubauen, gehen Sie folgendermaßen vor:

Vorsicht

Befestigen Sie das Chassis nicht oben am Rack. Ein kopflastiges Rack kann Umkippen und Geräte beschädigen sowie Personal verletzen.

Um Verletzungen von Personen oder Beschädigungen der Geräte zu vermeiden sollten folgende Schritte von zwei Personen ausgeführt werden,

1. Schieben Sie das Chassis vorne in das Rack.
2. Befestigen Sie das Chassis mit Schrauben. (Um Genaueres über die hierzu empfohlenen Schraubenarten zu erfahren, wenden Sie sich bitte an den Hersteller des Racks.)

Anschließen des Systems

Um das System zu verkabeln, gehen Sie folgendermaßen vor:

1. Stellen Sie sicher, daß der Netzschalter (*EIN*/*AUS*) am Chassis auf *AUS* (O) gestellt ist. (Ist Ihr System mit einem Spannungswahlschalter versehen, so stellen Sie den Schalter auf die Ihrem Standort gemäße Betriebsspannung.)
2. Stecken Sie das Sockelende des im Lieferumfang des Systems enthaltenen Chassisnetzkabels in die Netzsteckbuchse an der Rückseite des Chassis.
3. Stecken Sie das Sockelende des Bildschirmnetzkabels in die Anschlußbuchse an der Rückseite des Datensichtgerätes.
4. Stecken Sie ein Ende des Videokabels in die Anschlußbuchse des Datensichtgeräts (Video). (Dieser Schritt erübrigt sich, wenn das Videokabel permanent am Datensichtgerät befestigt ist.)
5. Stecken Sie das andere Ende des Videokabels in die sachgemäße Videoanschlußbuchse an der Rückseite des Systems.
6. Stecken Sie die Kabel für Tastatur und Maus in die entsprechenden Anschlußbuchsen an der Rückseite des Systems.
7. Stecken Sie alle Netzkabel in eine geerdete, gegen Spannungsspitzen geschützte Schuko-Steckdose.

Warnung

Vor Wartungsarbeiten am Chassis ist das Netzkabel vom Stromnetz zu trennen, um die Gefahr eines elektrischen Schlages oder andere mögliche Gefahren zu reduzieren.

Einschalten des Netzstroms

Nachdem Sie die Verkabelung des Systems vollzogen haben, können Sie den Netzstrom einschalten.

Warnung

Decken Sie alle offenen Modulschlitze ab, und setzen Sie alle Verkleidungen auf, bevor Sie den Netzstrom einschalten. Diese Maßnahmen sind notwendig, um das Chassis ordnungsgemäß zu kühlen und um die Gefahr eines elektrischen Schlages und andere mögliche Gefahren zu vermeiden. Für die Dauer des Systembetriebs müssen die Schlitzabdeckungen und die Verkleidungen angebracht sein.

Um den Netzstrom einzuschalten, stellen Sie den Netzschalter (*EIN*/*AUS*) am Chassis auf *EIN* (1). Die normale Startroutine des Systems erfolgt, und das System ist dann einsatzbereit.

Related Documentation

C

Emerson Network Power - Embedded Computing Documents

The Emerson Network Power - Embedded Computing publications listed below are referenced in this manual. You can obtain electronic copies of Emerson Network Power - Embedded Computing publications by contacting your local Emerson sales office. For documentation of final released (GA) products, you can also visit the following website: http://www.emersonnetworkpowerembeddedcomputing.com > Solution Services> Technical Documentation Search. This site provides the most up-to-date copies of Emerson Network Power - Embedded Computing product documentation.

Table C-1. Emerson Network Power - Embedded Computing Publications

Document Title	Publication Number
CPCI-7070 CompactPCI Single Board Computer and Transition Module Installation and Use	6806800A55
CompactPCI CPV5375 Single Board Computer and CPTM-01 Transition Module Installation and Use	CPIP5375A/IH
CPNV5375 CompactPCI Single Board Computer and CPTM-01 Transition Module BIOS and Programmer's Reference Guide	CPIP5375A/PG
CompactPCI CPV5365 Single Board Computer and CPTM-01 Transition Module Installation and Use	CPIP5365A/IH
CPIP/CPN5385 CompactPCI Single Board Computer Installation and Use	CPIP5385A/IH
CPIP/CPN5385 CompactPCI Single Board Computer Programmer's Reference Guide	CPIP5385A/PG
CPCI-6020 CompactPCI Single Board Computer Installation and Use	6806800A51
CPCI-6020 CompactPCI Single Board Computer Programmer's Reference Guide	6806800E73
CPCI-6115 CompactPCI Single Board Computer Installation and Use	6806800A68
CPCI-6115 Single Board Computer Programmer's Reference Guide	6806800G98

Table C-1. Emerson Network Power - Embedded Computing Publications (continued)

Document Title	Publication Number
CPV8540 CompactPCI Hot Swap Carrier Card User Manual (Single PMC)	CPV8540A/UM
CPV8540 CompactPCI Hot Swap Carrier Card User Manual (Dual PMC)	CPV8540B/UM
PPCBug Firmware Package User's Guide	PPCBUGA1/UM, and PPCBUGA2/UM
TMCP700 Transition Module Installation and Use	TMCP700A/IH

Related Specifications

For additional information, refer to the following table for related specifications. For your convenience, a source for the listed document is also provided. It is important to note that in many cases, the information is preliminary and the revision levels of the documents are subject to change without notice.

Table C-2. Related Specifications

Document Title and Source	Publication Number
Electronic Industries Alliance http://www.eia.org/	
Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange; Electronic Industries Alliance; http://global.ihs.com/index.cfm (for publications)	TIA/EIA-232 Standard
IEEE http://standards.ieee.org/catalog/	
Versatile Backplane Bus: VMEbus Institute of Electrical and Electronics Engineers, Inc. OR *Microprocessor system bus for 1 to 4 byte data* Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembé Geneva, Switzerland	ANSI/IEEE Standard 1014-1987
IEEE Standard for Compact Embedded PC Modules	IEEE P996.1
IEEE - Common Mezzanine Card Specification (CMC) Institute of Electrical and Electronics Engineers, Inc.	P1386 Draft 2.0
IEEE - PCI Mezzanine Card Specification (PMC) Institute of Electrical and Electronics Engineers, Inc.	P1386.1 Draft 2.0
Bidirectional Parallel Port Interface Specification Institute of Electrical and Electronics Engineers, Inc.	IEEE Standard 1284
PCI Industrial Manufacturers Group (PICMG) http://www.picmg.com/	

Table C-2. Related Specifications (continued)

Document Title and Source	Publication Number
Compact PCI Specification	CPCI Rev. 2.1 Dated 9/2/97
PCI-to-PCI Bridge Specification PCI-ISA Specification	Rev. 1.02 Rev. 2.0
CompactPCI Hot Swap Specification PCI Industrial Computers Manufacturers Group (PICMG)	PICMG 2.1 R1.0
PCI Special Interest Group (PCI SIG) http://www.pcisig.com/	
Peripheral Component Interconnect (PCI) Local Bus Specification, Revision 2.0, 2.1, 2.2 PCI Special Interest Group;	PCI Local Bus Specification

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